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STONE & WEBSTER MICHIGAN, INC.

P.O. BOX 2325, BOSTON, MASSACHUSETTS 02107

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

March 8, 1984

J.O. No. 14358 Ref. MPF 76

Attention: Mr. R. Cook

DOCKET NO. 50-339/330
MIDLAND PLANT UNITS 1 & 2
INDEPENDENT ASSESSMENT OF UNDERPINNING
REPORT NO. 76

A copy of the Independent Assessment of Underpinning Weekly Report No. 76 for the period of February 26, 1984 through March 3, 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 J. O. No. 14358 Midland Plant Units 1 & 2

Independent Assessment of Underpinning

Weekly Report No. 76

February 26, 1984 through March 3, 1984

Personnel on Site

Stone & Webster Michigan, Inc.

-		-9 Tuber		
P.	Majeski	2/28	-	3/3
	Benvie	2/27		
	Lykens	2/29		
J.	Springer	2/26	_	2/28
W.	Kilker	2/26		
D.	Zito	2/28		
L.	Rouen	2/26		
Α.	Lucks	2/28		

Parsons Brinckerhoff, Michigan Inc.

J. Oliveira 2/29 - 3/3 B. Metros 2/26 - 2/28

Meetings Attended

Date	Represented	Purpose
2/27 - 3/3	Stone & Webster Bechtel Consumers Power Parsons	Daily Assessment Team Meeting
2/29	Bechtel Consumers Power Stone & Webster	QAP Review Meeting

Underpinning and Remedial Soils - Construction

Ko-4 pier: Excavation of the pier shaft has been completed to el. 575.

Pier W-13: Placement of concrete in the pier shaft was completed to el. 592.3.

Pier W-16: Excavation of the drift and installation of support steel continues.

CT-1: The expavation and lagging have been completed to el. 567. Dewatering 1 being accomplished with lateral wellpoints.

Pier Kc-9: Placement of reinforcing steel is nearly complete. Plans are presently being prepared for placement of concrete in the pier.

Pier E-13: Excavation of the pier has been completed and installation of reinforcing steel is in progress.

Pier E-16: Excavation and lagging placement have progressed to el. 576.5.

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CT-12: Excavation and lagging placement have been completed to el. 564.

UATs: Installation of the lateral wellpoints in the east and west UATs to dewater the control tower area has began.

SWPS: Installation of the first level wale for the soldier pile wall on the east side of the SWPS is in progress.

Assessment Team Observations- Construction

Pier shaft and bell excavation, concrete placement, pier rejacking and dewatering activities continued in the Auxiliary Building. Concrete was placed in pier W-13. Inspection activities related to concrete placement were co-ordinated satisfactorily between the Contractor and MPQAD. All appropriate documentation was completed in a timely manner with no impact on the concrete placement activities. Placement of concrete was performed in accordance with applicable documents. Free falling of concrete was maintained within permissible tolerances. Vibration techniques used to consolidate the concrete were appropriate. Finishing and curing of concrete met procedural requirements. It is the Assessment Team's opinion that procedural and technical requirements were effectively implemented during placement of concrete resulting in both an efficient operation and a high quality installation.

During excavation of the shaft for pier E-16,a sand layer was encountered. Probing was performed to determine the extent of the sand layer. Results of the probing indicate that the sand extends into the area of the pier E-17 bell. Engineering is presently evaluating the impact on piers E-16 and E-17. The Assessment Team believes that the Contractor was responsive in recognizing the potential instability of the sand layer. The subsequent probing activities were prudent in order to minimize construction delays associated with these piers.

The Assessment Team observed installation of the first level wale for the soldier pile wall on the east side of the SWPS. Installation and placement of the wale as completed to date was accomplished in accordance with the project procedures. The grade on all wale seats was maintained within specified tolerances resulting in a level installation of the wale. The metal to metal contact between the wale and the wale supports was sand clasted to grey metal in accordance with surface preparation requirements. It is the opinion of the Assessment Team that procedural requirements were implemented adequately and the resulting wale installation was satisfactory.

Assessment Team Observations - QA/QC

The QAP task force met this week to discuss results of the subcommittee's Quality Inspection points review and evaluation. The subcommittee has reviewed construction procedures, PQCI's, and specifications associated with expansion anchor installation, fabrication and election of structural steel, and welding. Based on a review of these documents, changes have been recommended by the subcommittee to provide for more efficient implementation and inspection of the construction process. The subcommittee recommended that when new or revised construction procedures are developed attention should be directed at ensuring that:

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- 1. Construction procedures as supplemented by design drawings include all applicable information from the specification rather than using references.
- 2. Construction procedures and PQCIs are reviewed together for consistency.
- 3. A pilot program, to evaluate the effectiveness of a substantially revised PQCI against the current issue is implemented.
- 4. Each in-process inspection hold point should be evaluated to ensure that it is necessary to maintain the required level of quality.

The subcommittee has further recommended that because all items associated with temporary underpinning are not of the same significiance, Project Engineering should identify the most important items. The necessary quality attributes for these items would be defined in the design documents as a means to identify required inspection holdpoints.

As an additional effort to improve the efficiency of construction inspection activities, the subcommittee discussed processing of critical FCRs/FCNs and NCRs. It was pointed out that the method of handling these documents needs to be improved to provide for more timely resolution of FCRs/FCNs and NCRs.

The Assessment Team believes that the subcommittee recommendations concerning the efficiency of the quality inspection process are appropriate and that these changes can be implemented while still maintaining quality requirements. Additionally, the Assessment Team is of the opinion that expediting the processing of FCRs/FCNs and NCRs will greatly enhance the efficiency of the construction activities.

A review of MPQAD receipt inspection of structural steel plates and spin lock anchors was performed by the Assessment Team. Q.C. Inspection Reports were used as a basis for the evaluation. Inspection Reports were reviewed to verify material traceability, ensure that required documentation such as certificates of conformance and certified mill test reports were attached and completed correctly, verify qualifications and certifications of the inspector. and confirm that storage conditions were documented. All Inspection Reports and the attached documentation reviewed were completed accurately and the Inspectors certifications were found to be acceptable.

Work Activity Fackages

The following work Activity Package (WAP) overviews are in the open response stage or the open completed during the past week.

WAP No.	Title	Status Status		
		(Opened)	(Completed)	
74	Auxiliary Building Slab Support	2/23/84	2/28/84	
75	Concrete Encasement of Concrete Stress Meters for SWPS	2/23/84	2/27/84	

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WAP No.

Title

Status

(Opened) (Completed)

77

SWPS Install
Phase II A/B

Phase II A/B Soldier Beams 2/26/84 2/28/84

Nonconformance Identification Reports

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

NIR No.

Description

Status

(Opened) (Closed)

22

Resident Engineering

2/21/84

Document Control

Stations

Open Items

Items discussed during meetings are categorized as follows:

OPEN ITEMS - 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 auggoming 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 inentified open item. Tracking of the open item stops.

The following is a listing of all Open items from the Daily Meeting Notes with Bechtelan, the text of the Weekly Reports. Carry-over items from past weeks which are teen Closed this week are also lister.

Item No.	Description	Closure
58-3	Tubular Steel Lagging	Open
64-7	QAP Review Program	Open

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Item No.	Description	Closure
64-10	Treno Analysis	Open
77-4	US Testing Work Instructions	76-15
71-9	US Testing QA Manual	Open
71-17	Computerized Civil Drawing Register	Open
71-29	Use of "Retired" FCRs	Open
72-12	Welding Procedures	76-9
74-17	Co-ordination of Concrete Placement Activities	76-33
74-21	US Testing Corrective Action	Open
74-25	Expansion Anchors	Open
75-9	RE Document Control	Open
75-24	Assessment Team Sampling Methodology	76-10
76-14	Lateral Wellpoints at Piers CT-1/12	Open

Project Engineer

Project Manager

Held at Midland Site Midland, Michigan February 27. 1984

Present For:

Consumers Power		Bechte1	MPQAD	Stone & Webster	
G.	Murray	J. Fisher E. Cvikl J. Gaydos	J. McMaster	W. Kilker D. Zito J. Springer D. Benvie	
				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 76-1 - Auxiliary Building Underpinning Activities.

Installation of the third set of drift steel in the finger drift to Ko-4 is complete.

The mudmat installed on 2/25/84 at the bottom of pier W-13 was removed due to insufficient strength. A new mudmat meeting stength requirement was placed yesterday.

Excavation of the shaft for pier CT 12 has progressed into the mudmat at el. 583.

Resnore members for the pier E-16 access snaft grift have been welded into place.

(INFORMATION ITEM)

Item 76-2 - MRS Underpinning Activities.

J. Fisher to protect that preparations are being made to begin installation of the top level water for the soldier pile retaining wall at the SWPS. (INFORMATION ITEM)

<u>Item 76-3</u> - Resident Engineering Document Control.

E. Cvikl supplied the Assessment Team with copies of the Contractor's Quality Engineering procedures for monitoring Resident Engineering controlled documents and the administrative procedure for distributing and implementing the Fesicent Engineering Controlled Document Register. (Item 75-9 remains OPEN) (INFIRMATION ITEM)

Held at Midland Site Midland, Michigan February 27, 1984

Item 76-4 - NIR # 20.

The Assessment Team completed a review 2/24/84 of the response to NIR # 20. The response stated that there is no quality impact in calibrating the concrete admixture dispensers to a 12 fluid ounce limit vs an 8 fluid ounce limit. A small difference in admixture volume would have a negligible effect in slump and if any effect was noted the slump acceptance criteria will govern. The Assessment Team concurs with this response and therefore , NIR # 20 has been closed. (INFORMATION ITEM)

New Items

Item 76-5 - Testing of Piezometer BB-2.

D. Zito asked why it takes over a day to determine the quantity of soil particles discharged at piezometer BB-2. J. Fisher will respond. (OPEN ITEM)

Item 76-6 - Expedition of Drill Permits Process.

J. Springer asked if checking design drawings to identify the possible presence of rebar in fill concrete prior to the start of concrete removal would help expedite the drill permit process and alleviate delays similar to those that have occurred. J. Fisher responded that the presence of rebar in fill concrete cannot always be determined from design drawings. Additionally, the drill permit procedures do not allow prior approval for cutting rebar. (CLOSED ITEM)

Item 76-7 - Oil Observed at Jacks.

B. Metros stated that he had observed the presence of oil on the jacks at piers Kc-2 and Kc-11 and questioned the cause of the oil. J. Fisher will respond. (OPEN ITEM)

Item 76-8 - Rejacking of the W-8 Grillage.

J. Fisher reported that rejacking of the W-8 grillage to increase the load on the grillage is scheduled for 2/29/84. Loading of the grillage will be done in increments not exceeding 5% of the specified design load. An evaluation will be made after each 5% increment on whether to monitor for acceptance or continue to the next increment. The maximum load in the grillage will not exceed 160% of the specified design load during rejacking. Additionally, upward building movement at the grillage will be limited to 90 mils. (INFORMATION ITEM)

Response Items

Item 76-9 - Welding Procedures.

J. Springer stated that the Contractor has finished their evaluation of welding completed to date. The evaluation found that none of the welding

Held at Midland Site Midland, Michigan February 27, 1984

completed had been performed under conditions of severe external shrinkage restraint. The Assessment Team concurs with this conclusion. (All other action items listed in Item 72-17 have been previously addressed. Therefore, Item 72-12 is closed) (CLOSES ITEM 72-12)

Item 76-10 - Assessment Team Review of RE Document Control.

W. Kilker provided a description of the sampling techniques used and attributes considered for the Assessment Team review of the Resident Engineers document control station. Based on standard sampling techniques, 50 drawings out of a total population of 402 drawings were selected for review. Attributes evaluated during the review included verification of proper revision numbers, the presence of change documents and legibility of the documents. The Design Document Register and the Resident Engineers Distribution Schedule were used on a basis for performing the review. (CLOSES ITEM 75-24)

Held at Midland Site Midland, Michigan February 28, 1984

· Present For:

Consumers Power	Bechtel	MPQAD	Stone & Webster	
G. Murray	J. Fisher E. Cvikl J. Gaydos	J. McMaster	D. Benvie W. Kilker D. Zito J. Springer A. Lucks 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 76-11 - Auxiliary Building Underpinning Activities.

Excavation of the pier Kc-4 shaft has began.

Excavation of the pier E-13 has been completed to subgrade el. 564.7 . (INFORMATION ITEM)

Item 76-12 - Dewatering Control Tower Area.

J. Fisher stated that two horizontal drains will be installed in each of the UATs in order to drain perched groundwater from beneath the control tower. (INFORMATION ITEM)

Item 76-13 - Trend Analysis.

J. McMaster distributed copies of MPQAD procedures M 2-1 which will be used to implement a trend analysis program for tracking NCRs. The procedure effectivity date is 4/1/84. (Item 64-10 remains OPEN (INFORMATION ITEM)

Item 76-14 - Lateral Wellpoints at pier CT-1/12.

B. Metros requested that FSO review the operation of the lateral wellpoints installed in piers CT-1/12 to determine if the performance could be improved. J. Fisher will respond. (OPEN ITEM)

Held at Midland Site Midland, Michigan February 28, 1984

Response Items

Item 76-15 - US Testing Work Instructions.

Submittal of issued US Testing Work Instructions to the Assessment Team is being tracked under Item 74-21 and therefore Item 71-4 is closed. (CLOSES ITEM 71-4)

Item 76-17 - Testing of Piezometer BB-2.

J. Fisher stated that it does not take a full day to perform testing needed to determine the quantity of soil particles discharged at the piezometer. Performance of this test takes 12 hours. The remaining time required to place piezometer BB-2 into service was associated with well development. (CLOSES ITEM 76-5)

Held at Midland Site Midland, Michigan February 29, 1984

"Present For:

Consumers Power	Bechtel	MPQAD	Stone & Webster
G. Murray	J. Fisher E. Cvikl J. Gaydos M. Blendy J. Kelliher	J. McMaster R. Sevo	D. Benvie R. Lykens P. Majeski Parsons Brinckerhoff
			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 76-18 - Auxiliary Building Underpinning Activities.

A sand seam was encountered during excavation of the shaft for pier E=16. Grouting plans are being developed to stabilize the sand in the vicinity of the pier shaft. Additionally, probing will be performed in pier E=16 to assess the extent of the sand layer in the vicinity of pier E=17.

Excavation of the shafts for piers CT-1/12 has progressed through the mudmat at el. 583.

Installation of reinforcing in pier W-13 has began.

Placement of the drift post rakers in piers W-'6 has been completed. (INFORMATION ITEM)

Item 76-0 - Trend Analysis.

J. McMaster stated that methodology for commuling the data base for use in implementing the trend analysis procedure is presently being developed. Compilate: of the data base is scheduled for completion by 4 2 54. Item 64-10 remains OPEN) (INFORMATION ITEM)

Item 76-20 - Expansion Anchors.

M. Blendy discussed possible changes being evaluated to improve the Hilti bolt installation program. The use of a rapid set grout to provide a uniform surface beneath the bearing plate is being considered to address loosening of washers. The contractor is also evaluating the possibility of loosening the Hilti bolts after initial tensioning until construction activities in the vicinity of the bolt have progressed away from the area such that possible vibrations due to work in progress do not impact the

Held at Midland Site Midland, Michigan February 29, 1984

Hilti anchorage. The Hilti's will then be retensioned to design load. (Item 74-25 remains OPEN) (INFORMATION ITEM)

Item 76-21 - Resident Engineering Document Control.

E. Cvikl provided the Assessment Team with a copy of Management Correctice Action Report # 73. (Item 75-9 remains OPEN) (INFORMATION ITEM)

New Items

No new items were discussed.

Response Items

Item 76-22 - Oil Observed at Jacks.

J. Fisher responded to the Assessment Teams' question concerning oil observed at the Kc-2 and Kc-11 jacks. During removal of the hoses from the jacks, some oil may have leaked out of the hoses and onto the jacks. To date the leaking oil has not impacted the load carrying capacity of the jacks. In any case, overall performance of the jacks is closely monitored to ensure that jacks perform satisfactorily. (CLOSES ITEM 76-7)

Held at Midland Site Midland, Michigan March 1, 1984

Present For:

Con	sumers Power	Bec	htel	MPC	AD	Sto	one & Webster
G. J.	Murray Schaub	E. J.	Fisher Cvikl Gaydos Cleary		McMaster Sevo		Benvie Majeski Lykens
						Par	rsons Brinckerhoff
						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 76-23 - Auxiliary Building Underpinning Activities.

Preliminary probing in pier E-16 indicates that the sand layer encountered in E-16 may be present in pier E-17. Additional probings will be performed today in order to retrieve soil samples in the vicinity of the E-17 bell.

Placement of reinforcement in Piers Kc-9 and W-13 has been completed.

Rejacking of the W-8 grillage began yesterday.

(INFORMATION ITEM)

item 76-24 - SWPS Underpinning Activities.

J. Fisher stated that installation of the waler on the soldier offe wale along the east side of the SWPS has been completed. INFIRMATION ITEM.

Item 75-25 - Tubular Steel Lagging.

E. Cvikl resided the Assessment Team with 2 of 3 DCNs designating those areas in The Lainity of the Auxiliary Building where filling of internal voids in Tabular steel lagging is required. Issuance of the third DCN has been related until MPQAD has reviewed the DCN. J. McMaster was requested to determine the reason for the delay with MPQADs review of the DCN. (Item 58-3 remains OPEN) (INFORMATION ITEM)

Item 76-26 - US Testing Corrective Action.

R. Cleary gave a status report on upgrading being undertaken by US Testing. The scheduled completion date for qualifying 90% of US Testing technicians to at least 20 certifications is 6/22/84. As a result of the reorganization of US Testing required by FSO, only one lab chief will be required on site. The lab chief is expected to be qualified to 44 certifications by 4/1/84.

Held at Midland Site Midland, Michigan March 1, 1984

Twenty five work instructions are presently being reviewed by Project Engineering. Issuance of the remaining twenty two work instructions is scheduled for completion on 4/1/84. P. Majeski requested that FSO advise the Assessment Team as to the level of training that will be required for US Testing assisstant 140 chiefs. (Item 74-21 remains OPEN) (INFORMATION ITEM)

New Items

Item 76-27 - FSO Controlled Document Review.

P. Majeski requested a copy of the monthly FSO document control station review performed in February. J. Fisher will respond. (OPEN ITEM)

Item 76-28 - Weekly Report # 75.

Weekly Report # 75 was reviewed for open items. It was determined that all open items had been previously identified. (CLOSED ITEM)

Response Items

No response items were discussed.

Held at Midland Site Midland, Michigan March 2, 1984

Present For:

Consumers Power		Bechtel Bechtel		MPQAD		Stone & Webster	
R.	Murray Wheeler Wieland	E.	Fisher Cvikl Gaydos	-	McMaster Sevo	P.	Bervie Majeski Lykens

Parsons Brinckerhoff

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 76-29 - Auxiliary Building Underpinning Activities.

Concrete was placed in pier W-13.

Installation of reinforcing steel in pier E-13 has begun.

Additional probing in pier E-16 indicates that a portion of the bell for pier E-17 is in natural sand.

The W-8 grillage was locked off yesterday at 120% of specified design load.

(INFORMATION ITEM)

Item 76-30 - Tubular Steel Lagging.

J. McNaster discussed the delay associated with MPQADs review of the DCN for filling of tubular lagging internal voids at the Auxiliary Building. Due to the Stop Work Order a large backlog of drawings had accumulated at Central Locument Control. Since lifting of the Stop Work Order, distribution of the accumulated controlled documents has been slow due to the large backlog. MPQAD has only recently received the drawing needed to review the DCN. (Item 58-3 remains OPEN) (INFORMATION ITEM)

New Items

No new items were discussed.

Held at Midland Site Midland, Michigan March 2, 1984

Response Items

Item 76-31 - FSO Controlled Document Review.

J. Fisher stated that although a monthly review had not been conducted in February, a review verification program is being implemented during the FSO takeover of the underpinning subcontractors document control stations. This verification process effectively satisfies the intent of the monthly review. (CLOSES ITEM 76-27)

Item 76-32 - Co-ordination of Conctete Placement.

The Assessment Team observed the placement of concrete at pier W-13. In the Assessment Teams opinion, the co-ordination effort on the part of FSC and MPQAD was good resulting in a timely completion of inspection activities associated with placement of concrete. Therefore, Item 74-17 is closed. (CLOSES ITEM 74-17)