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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

May 2, 1984
 J.O. No. 14358
 Ref. MPF 84

Attention: Mr. Cook

DOCKET NO. 50-30/330
 MIDLAND PLANT UNITS 1 & 2
 INDEPENDENT ASSESSMENT OF UNDERPINNING
 REPORT NO. 84

A copy of the Independent Assessment of Underpinning Weekly Report No. 84 for the period of April 22, 1984 through April 28, 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.

D.A. Benve for A.S. Lucks

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. 84

April 22, 1984 through April 28, 1984

Personnel on Site

Stone & Webster Michigan, Inc.

P. Majeski	4/26 - 4/28
D. Benvie	4/23 - 4/28
D. Zito	4/23 - 4/28
W. Kilker	4/23 - 4/27
S. Lucks	4/26

Parsons Brinckerhoff Michigan, Inc.

J. Oliveira	4/26 - 4/28
B. Metros	4/22 - 4/24

Meetings Attended

<u>Date</u>	<u>Represented</u>	<u>Purpose</u>
4/23 - 4/27	Stone & Webster Bechtel Consumers Power Parsons	Daily Assessment Team Meeting
4/24	Consumers Power Bechtel MPQAD Stone & Webster	Project Soils Meeting
4/27	Stone & Webster Consumers Power Bechtel MPQAD	Interorganizational Meeting
4/27	Stone & Webster Consumers Power Bechtel MPQAD	Document Control Information Meeting

Underpinning and Remedial Soils - Construction

Pier E17: Excavation of the pier has begun. The type of soil encountered during initial excavation was judged to be unsuitable for bellling. As a result, the alternate design consisting of a straight pier with an enlarged shaft area will be implemented.

Pier E5: Drifting to the reactor containment for installation of the E5 grillage was completed. Pier excavation progressed to the top of the bell and the ring beam was installed. Excavation of the drop pit for installation of the E5 grillage support columns at the reactor containment is in progress.

Kc4-Kc5 and Kc9-Kc8 Drifts: Excavation of these drifts was completed through to the UATs. Excavation of the Kc5 and Kc8 piers is scheduled to begin next week.

Piers CT 3/10: Excavation of the drop pits for piers CT 2/11 was completed allowing drifting to piers CT 3/10 to commence.

Pier W5: Pier excavation progressed to the top of the bell and installation of the ring beam was completed. Excavation of the drop pit required for installation of the W5 grillage support columns at the reactor containment is in progress.

Pier W17: Excavation of the pier was completed to founding grade. Bell excavation is scheduled to start this week.

Access Shaft Level "C" Wales: Alignment and fitup of the Level C wales continued for the east and west access shafts.

SWPS: Installation of the upper level wales and support struts has been completed on the east side of the SWPS. Excavation below the upper level of wales is in progress on the east side. Embedded and surface mounted strut plates and strut installation for support of the upper wales continued on the north and west side of the SWPS.

BWSTs: Construction of the ring beam addition for both tanks is in progress.

Cathodic Protection: Trench excavation for installation of cathodic protection is in progress.

Assessment Team Observations - Construction

The level of activity associated with the Auxiliary Building underpinning has increased significantly during the past two weeks. Construction has started on eight piers. Excavation and lagging installation for piers E/W5 and E/W17 was performed in accordance with procedural requirements. The Contractor was careful to minimize over excavation both horizontally and vertically. Excavation was followed closely by lagging installation, ensuring that the height of unsupported soil within the pier excavations did not exceed the specified amount. Backpacking behind the lagging was tamped firmly and evenly into place. In those areas of the W17 pier where over excavation behind the lagging exceeded the design requirements, the Subcontractor placed grout in accordance with the procedures. Adequate measures were taken by the Subcontractor to control and remove water seepage in the E5 and W17 pier excavations, minimizing softening of the in place soil.

Installation of the drift set adjacent to the reactor containment wall for the E5 drift was observed by the Assessment Team. The contractor used both manual and optical survey methods to maintain alignment throughout the installation process. Installation and torqueing of the drift set expansion anchors to the required tension completed the satisfactory installation of this drift set.

Midland Plant

Units 1 & 2

Independent Assessment of Underpinning

As part of the direct hire work for 1984, the Contractor has resumed work on the Borated Water Storage Tanks (BWSTs). The Assessment Team observed the Contractor perform a status assessment of the work completed to date on the ring beam additions at the BWSTs. This verification process consists of checking the installed concrete reinforcing steel for proper sizing, spacing and clear cover. The Assessment Team believes that this reverification process is a prudent measure on the part of the contractor considering the length of time work on the BWSTs had been discontinued.

Assessment Team Observation - QA/QC

The Assessment Team observed certification of the Nelson stud welding machine and the machine operator. As part of the certification test, the operator was required to weld a series of 10 Nelson studs. MPQAD measured the energy output of the welding machine during welding of each stud to verify that the machine output was steady and constant. Finally, the Nelson studs were strength tested by bending the studs 90° from their original position. None of the welded studs failed, concluding the successful certification of the welding machine and the operator.

MPQAD inspection of drift set expansion anchors and anchor bolts for the Level C wale support plates was overviewed by the Assessment Team. The inspector ensured that the anchor and bolt holes were drilled to the proper depths. The inspection also verified that the anchors and bolts were tensioned to the appropriate design loads with calibrated tensioning equipment. After the installations were completed, the inspectors marked the anchor nuts with an adhesive to aid in examining the anchors for signs of loosening during subsequent inspections. The Assessment Team concludes that the MPQAD inspections of the expansion anchor and anchor bolt installations were thorough. The thoroughness observed indicates that the MPQAD inspectors are sufficiently knowledgeable of design and procedural requirements for expansion anchor and anchor bolt installation.

Work Activity Packages

No work activity packages were overview 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>
22	Resident Engineering Document Control	(Opened) (Closed) 2/21/84
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 open 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 which have been Closed this week are also listed.

<u>Item No.</u>	<u>Description</u>	<u>Closure</u>
64-10	Trend Analysis	Open
71-17	Computerized Civil Drawing Register	Open
74-21	US Testing Corrective Action	Open
79-26	Upper Leveling Plates	Open
79-28	SWPS Backpacking Material	Open
79-34	SWPS Backpacking Placement	Open
81-21	BOP Construction Verification of Soils Work	Open
82-3	Surface Voids in Grout	Open
82-9	Trend Analysis Update	Open

<u>Item No.</u>	<u>Description</u>	<u>Closure</u>
83-17	Crackmapping Subcontractor Audit	84-25
84-12	Diesel Fuel Oil Lines	Open
84-13	SWPS Phase II Cofferdam	Open
84-20	Design Drawing Requirements for BWST Ring Beam Addition	Open
84-21	Repair of BWST Ring Beam Cracks	Open
84-22	BWST Concrete Reinforcing Steel	Open
84-23	BWST Corrosion Protection and Waterproofing	Open
84-24	Repair of Concrete Surface Imperfections of the BWSTs	Open

DA Genie for W. E. Kiker
Project Engineer

DA. Benzie for A. S. Lucke
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 23, 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	None	D. Benvie D. Zito <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 84-1 - Auxiliary Building Underpinning Activities.

Excavation of the drop pits for CT 2/11 is almost complete. Drifting to CT 3/10 will commence upon completion of the CT 2/11 drop pits.

Excavation of the Kc4 to Kc5 drift has been completed through to the west UAT.

Excavation of the Kc9 to Kc8 drift continued. The drift heading is approximately 8' from the east UAT.

The drift excavation for the W5 grillage has been completed. Excavation of the W5 pier is scheduled to begin today.

Drifting to the reactor containment for the E5 grillage continued. Excavation of the E5 pier is in progress.

Excavation of the W17 pier shaft has been completed to founding grade. Bell excavation is scheduled to start today.

Drift excavation for the E17 pier has been completed.

Grouting of the Level C wale support plates has begun in the east access shaft.

(INFORMATION ITEM)

Item 84-2 - SWPS Underpinning Activities.

J. Fisher reported that installation of the large embedded strut plate on the SWPS is scheduled for today. Grouting of the strut plates along the east side of the SWPS has been completed. Further excavation on the east side of the SWPS below the first level of wales will begin shortly. (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 23, 1984

Item 84-3 - Upper Leveling Plates.

J. Kelleher stated that the welding demonstration to evaluate the effect of using smaller welds for the upper leveling and bearing plate assembly was completed on Friday. In the demonstration, one side of the assembly was welded with a 1/2 in. weld while the other side used a 1/4 in. weld. As expected, warping was less on the side where the 1/4 in. weld was used. Engineering is presently evaluating the results of the test. (Item 79-26 remains OPEN) (INFORMATION ITEM)

New Items

Item 84-4 - Slotted Holes for Tubular Steel Lagging.

D. Zito asked if the NCR written due to fabrication of oversized holes for pieces of tubular steel lagging had been resolved. J. Fisher responded that the NCR is presently being dispositioned to use as is. (CLOSED 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 24, 1984

Present For:

Consumers Power

G. Murray

Bechtel

J. Fisher
J. Kelleher
E. Cvikl

MPQAD

R. Sevo

Stone & Webster

D. Benvie
D. Zito
W. Kilker

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 84-5 - Auxiliary Building Underpinning Activities.

Excavation of the E17 and W5 piers has been initiated.

Excavation of the drop pits to piers CT 2/11 have been completed.

The drift excavation for the E5 grillage is complete.

Grouting of the Level C wale support plates has begun in the west access shaft.

(INFORMATION ITEM)

New Items

Item 84-6 - Drift for the W5 Grillage.

W. Kilker asked why the spaces between the wood lagging have been sealed for that portion of the W5 drift closest to the reactor containment. J. Fisher responded that some over excavation behind the lagging had occurred in this section of the drift. As a result, the area behind the lagging will be grouted rather than backpacked. The spaces between the lagging have been sealed to prevent any loss of grout during placement. (CLOSED ITEM)

Item 84-7 - Loading of E/W5 Grillages.

D. Benvie reviewed the loading sequence for the E/W5 piers and grillages and noted that unlike the E/W8 piers, the E/W5 piers will not be preloaded prior to loading of the grillages. He asked if there was a specific reason for not preloading the piers. E. Cvikl and J. Fisher responded that the E/W8 piers were preloaded because of additional loads in that area of the turbine building. These additional loads are not present in the vicinity of the E/W5 piers. (CLOSED ITEM)

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

Held at Midland Site
Midland, Michigan
April 24, 1984

Item 84-8 - Cathodic Protection.

D. Benvie asked what specific work is ongoing associated with cathodic protection. J. Fisher responded that trenching required for installation of the cathodic protection is presently underway. It is anticipated that soil drilling of boreholes associated with the cathodic protection will begin in 4 to 6 weeks. (CLOSED 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 25, 1984

Present For:

<u>Consumers Power</u>	<u>Bechtel</u>	<u>MPQAD</u>	<u>Stone & Webster</u>
G. Murray	J. Fisher	R. Sevo	D. Benvie
	J. Kelleher	J. McMaster	D. Zito
	E. Cvikl		W. Kilker
			<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 84-9 - Auxiliary Building Underpinning Activities.

Placement of grout in the over excavated area behind the W5 drift lagging is complete.

The concrete mudmat for the W17 pier base has been placed.

Installation of the steel collar frame for the drift to pier CT 3 will begin today.

The soil encountered during excavation of the E17 pier was judged to be unsuitable for bellling. As a result, the alternate design consisting of a straight pier with an enlarged shaft area will be implemented.

(INFORMATION ITEM)

Item 84-10 - SWPS Underpinning Activities.

J. Fisher reported that extension of the bentonite seal at the joint between the SWPS and the Circulating Water Intake Structure will start today. The bentonite seal is being extended to prevent inflow of water through the joint from beneath the seal.

It was reported that preparations are being made to allow the use of wood lagging in place of tubular steel lagging for the soldier pile wall in those areas where the lagging span is less than 8 feet. (INFORMATION ITEM)

New Items

Item 84-11 - FSO Controlled Document Review.

J. Fisher reported that a review of FSO Controlled Documents will be performed this weekend by the FSO Quality Engineer. In the future, the FSO Quality Engineer will perform a review of the FSO controlled documents once every two months. FSO will continue to "self-audit" their controlled documents once a month. (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 25, 1984

Item 84-12 - Diesel Fuel Oil Lines.

D. Benvie asked for the status on initiation of work for the diesel fuel oil lines. J. Fisher will respond. (OPEN ITEM)

Item 84-13 - SWPS Phase II Cofferdam.

D. Benvie requested that the Assessment Team be provided with details of the proposed alternative under consideration for the SWPS Phase II cofferdam. The cofferdam is required for rebedding of the service water lines. J. Fisher 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 26, 1984

Present For:

<u>Consumers Power</u>	<u>Bechtel</u>	<u>MPQAD</u>	<u>Stone & Webster</u>
D. Puhalla	J. Fisher J. Kelleher E. Cvikl	R. Sevo J. McMaster	D. Benvie D. Zito W. Kilker P. Majeski S. Lucks
			<u>Parsons Brinckerhoff</u> 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 84-14 - Auxiliary Building Underpinning Activities.

Excavation of the drop pit for installation of the W5 grillage support columns at the reactor containment has begun.

Backfill grout was placed in the W17 bell due to minor soil sloughing.

Excavation of the Kc9 to Kc8 drift has been completed to the east UAT.

(INFORMATION ITEM)

Item 84-15 - SWPS Underpinning Activities.

J. Fisher reported that the large embedded strut plate on the SWPS north wall has been set into place. Welding of the soldier pile wall struts to the strut plate is in progress. (INFORMATION ITEM)

Item 84-16 - SWPS Phase II Cofferdam and Diesel Fuel Oil Lines.

J. Fisher reported that Bechtel will present to CP Co on 4/27/84 details of the proposed alternatives under consideration for the SWPS Phase II cofferdam. Also, the status of the work associated with this diesel fuel oil line will be discussed. (Item 84-13 and 84-14 remains OPEN) (INFORMATION ITEM)

New Items

Item 84-17 - Weekly Report # 83.

The text of Weekly Report # 83 was reviewed. It was determined that all open items had been previously identified. (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 26, 1984

Item 84-18 - Central Document Control Center Weekly Meeting.

J. McMaster stated that a weekly meeting will be held starting tomorrow at which, Central Document Control personnel will meet with MPQAD to discuss the status of the Central Document Control upgrading process. The Assessment Team will also attend this meeting. The meeting will serve as a forum for presenting and answering questions related to Central Document Control activities. (INFORMATION ITEM)

Response Items

No response items were addressed.

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

Held at Midland Site
Midland, Michigan
April 27, 1984

Present For:

Consumers Power

G. Murray
R. Wieland

Bechtel

J. Fisher
J. Kelleher
E. Cvikl

MPQAD

J. McMaster
R. Sevo

Stone & Webster

D. Benvie
D. Zito
W. Kilker
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 84-19 - Auxiliary Building Underpinning.

Installation of the steel collar frame in the CT 11 drop pit is in progress.

Excavation of the drop pit for installation of the E5 grillage support columns at the reactor containment has begun.

(INFORMATION ITEM)

New Items

Item 84-20 - Design Drawing Requirements for BWST Ring Beam Additions.

D. Zito discussed the design drawing requirements for the ring beam addition at each of the BWSTs. It was noted that the drawings indicate that concrete for each ring beam addition will be placed to the same elevation as the top of the existing ring beam and valve pit. However, the actual conditions do not match these indicated on the design drawing in that the top of the existing ring beam is approximately 1.5 inches higher than the top of the valve pit. The Assessment Team requested FSO to evaluate what impact if any, this elevation inconsistency will have at the interface of the ring beam addition and the valve pit for each BWST. (OPEN ITEM)

Item 84-21 - Repair of BWST Ring Beam Cracks.

D. Zito asked if cracks in the existing ring beam greater than 10 mils have been mapped and repaired. J. Kelleher responded that cracks greater than 10 mils have been mapped and repaired in accordance with engineering requirements. The Assessment Team asked if the cracks on the underside of the valve pit top slab will require repair. J. Fisher will respond. (OPEN ITEM)

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

Held at Midland Site
Midland, Michigan
April 27, 1984

Item 84-22 - BWST Concrete Reinforcing Steel.

D. Zito noted that reinforcing steel placed in the low area on the west side of the Unit No. 1 BWST is continuously wet and dirty. He asked what action is planned to correct this condition. J. Fisher will respond.
(OPEN ITEM)

Item 84-23 - BWST Corrosion Protection and Waterproofing.

D. Zito discussed corrosion protection and waterproofing requirements for the BWSTs. It was pointed out that the channel sections being used to support reinforcing cage above the concrete mudmat may contribute to corrosion of the reinforcing cage.

The need for and condition of the existing waterstop was discussed. The waterstop has been damaged in the vicinity of the valve pits for each of the BWSTs. The Assessment Team requested FSO to evaluate what effects if any, these conditions will have on the corrosion protection and waterproofing for the BWSTs. (OPEN ITEM)

Item 84-24 - Repair of Concrete Surface Imperfections of the BWSTs.

D. Zito stated that project specifications require that surface imperfections for formed concrete be repaired as soon as practical after removal of forms. It was noted that minor surface imperfections on those portions of the Unit 2 BWST ring beam addition placed last year have not been repaired. The Assessment Team requested FSO to review the intent of the specification in regards to timely repair of the surface imperfections. (OPEN ITEM)

Response Items

Item 84-25 - Crackmapping Subcontractor Audit.

E. Cvikl provided the Assessment Team with a copy of the MPQAD Report summarizing the results of their audit of the crackmapping subcontractor (WJE).
(CLOSES ITEM 83-17)