



# STONE & WEBSTER MICHIGAN, INC.

P.O. Box 2325, BOSTON, MASSACHUSETTS 02107

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

May 22, 1984

J. O. No. 14358  
 Ref. MPF 87

Attention: Mr. R. Cook

DOCKET NO. 50-300/330  
 MIDLAND PLANT UNITS 1 & 2  
 INDEPENDENT ASSESSMENT OF UNDERPINNING  
 REPORT NO. 87

A copy of the Independent Assessment of Underpinning Weekly Report No. 87 for the period of May 13, 1984 through May 19, 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.

*W E Keller for AS 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. 87

May 13, 1984 through May 19, 1984

Personnel on Site

Stone & Webster Michigan, Inc.

P. Majeski	5/13 - 5/15
D. Benvie	5/14 - 5/18
D. Zito	5/14 - 5/18
W. Kilker	5/17 - 5/19
L. Rouen	5/15 - 5/19

Parsons Brinckerhoff Michigan, Inc.

J. Oliveria	5/13 - 5/15
B. Metros	5/16 - 5/19

Meetings Attended

<u>Date</u>	<u>Represented</u>	<u>Purpose</u>
5/14 - 5/16 5/18	Stone & Webster Bechtel Consumers Power Parsons	Daily Assessment Team Meeting
5/18	Consumers Power Bechtel MPQAD Stone & Webster	Weekly Interorganizational Meeting
5/18	Consumers Power Bechtel MPQAD Stone & Webster	Document Control Information Meeting

Underpinning and Remedial Soils - Construction

Pier E/W5: Concrete placement for each pier shaft and grillage support column installations were completed. Installation of the shim plates for the bearing assemblies is in progress.

Pier Kc8: Excavation for the pier has progressed approximately 8 ft.

Pier E17: Installation of the jacks and jackstands for the middle portion of the enlarged shaft is in progress.

Pier CT 3/10: The pier shafts have been excavated to founding subgrade.

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Pier Kc5: Excavation of the pier shaft and installation of the pier shaft mudmat was completed. Bell excavation is nearly complete.

Pier W17: No further activity was performed pending fabrication of lagging materials to support the enlarged shaft.

SWPS: Installation of the upper level wales continued on the north and west sides. Excavation and lagging installation was completed to El. 620' along the east side of the excavation.

BWSTs: Reinforcing steel formwork installation and concrete placement continued.

Cathodic Protection: Trench excavation and backfilling work continued.

#### Assessment Team Observations - Construction

The Assessment Team performed an independent inspection of the reinforcing steel installed in pier E5. Attributes verified during the inspection included number and location of reinforcing steel, spacing, clear cover, splice lengths, stirrup locations, hairpin ties, Fox Howlett coupler locations and absolute dimensions. All attributes were determined to be in accordance with design requirements. Fox Howlett coupler installation at W5 was overviewed by the Assessment Team. The reinforcing steel which had previously been threaded for the Fox Howlett couplers was properly stored at the work area to protect the threads from damage. Installation of these couplers conformed with applicable procedures. The craftsmen applied the necessary torque to the couplers as required to secure the reinforcing steel. After proper embedment of the Fox Howlett couplers was verified, the completed coupler was marked by QC indicating an acceptable installation.

Backpacking for pier CT 3 and the subsequent field and resident engineering inspection was overviewed by the Assessment Team. Backpacking was installed and firmly tamped into place ensuring adequate contact between the lagging and in-situ soil. The inspection performed by resident and field engineering was thorough. This engineering inspection found one set of lagging placed on the previous shift where backpacking had either fallen out or was not placed. This situation was immediately corrected.

The Assessment Team observed the entire concrete placement for the E5 pier shaft and placement of the last lift for the W5 pier shaft. Placement technique including lift height, lateral movement, free drop, and concrete vibration was in accordance with good construction practice. Field engineering and supervision supporting the placement activities was judged to be acceptable. The nonmanual personnel associated with the placement activities were knowledgeable of correct placement techniques to ensure conformance with design requirements.

The Assessment Team attended a daily direct hire meeting. Planned activities and the required engineering, quality inspection and construction support were discussed. The Assessment Team believes that these meetings are a useful

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tool to aid in manpower planning for support of the direct hire work on a day-to-day basis.

#### Assessment Team Observations - QA/QC

The Assessment Team overviewed MPQAD inspection of the upper Carlson Meter installations at pier E5. The inspector verified that dimensional requirements including spacing, plumb and level conformed with the design.

MPQAD inspection of Q backfill for the cathodic protection installation was satisfactory. The inspector verified that loose lift thickness, number of passes, required overlap of passes and compaction equipment conformed with the required placement technology.

MPQAD inspection of concrete placed for the E5 pier was observed by the Assessment Team. Qualifications of the MPQAD inspector to the appropriate certifications was determined to be acceptable. The inspector verified that the US Testing personnel performing slump testing air entrainment, and preparing concrete cylinders did so in accordance with ASTM procedures.

The Assessment Team attended a quality session held to review quality requirements associated with expansion anchor installation. The instructor emphasized the need for prerequisite documentation to be in place at the appropriate work areas and explained the purpose of the QC holdpoints. The Assessment Team believes that this session adequately provided the craftspeople with an awareness for the need to maintain high quality standards in performing their work.

#### Work Activity Packages

<u>WAP No.</u>	<u>Title</u>	<u>Status</u>
86	Support Brackets for Kc 5.89, Kc 6 and Kc7 Turbine Building	(Opened) (Closed) 5/18/84

#### Nonconformance Identification Reports

No nonconformance reports were opened or active during the past week.

#### Open Items

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.

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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	87-35
79-28	SWPS Backpacking Material	Open
79-34	SWPS Backpacking Placement	Open
81-21	BOP Construction Verification of Soils Work	Open
82-9	Trend Analysis	Open
85-29	Auxiliary Building Access Shaft Grout Shims	87-19
86-4	Auxiliary Building Crackmapping	Open
87-5	Implementation of the QAP Task Force Recommendations	Open
87-10	Reverification of Previously Mapped Cracks at the BWSTs.	Open
87-15	Excavation Conveyors at the SWPS	Open
87-24	Control Tower Instrumentation Reading	Open

*W E Kilber*  
 Project Engineer

*W E Kilber AS Smith*  
 Project Manager

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

Held at Midland Site  
Midland, Michigan  
May 14, 1984

Present For:

<u>Consumers Power</u>	<u>Bechtel</u>	<u>MPQAD</u>	<u>Stone &amp; Webster</u>
G. Murray	J. Fisher J. Kelleher E. Cvikl	R. Sevo	D. Benvie D. Zito P. Majeski
			<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 87-1 - Auxiliary Building Underpinning Activities.

Removal of drift sets and soil between piers E/W10 and 11 was completed. Excavation of the Kc8 pier shaft has begun.

Installation of pier E5 shaft rebar is in progress.

Placement of concrete for the middle portion of the E17 enlarged pier was completed.

Excavation of the CT 3/10 pier shafts continued.

Installation of the W5 pier shaft rebar is nearing completion.

Excavation of the Kc5 pier shaft is in progress.

Level C Wale installation was completed for the west access shaft.

(INFORMATION ITEM)

Item 87-2 - BWST Ring Beam Additions.

J. Fisher reported that concrete for a portion of the ring beam addition at both BWSTs will be placed today. (INFORMATION ITEM)

Item 87-3 - SWPS Backpacking Method.

P. Majeski stated that the Assessment Team had looked at the backpacking at the SWPS this past weekend. The quality of the installed backpacking has improved but there is one area that still requires upgrading. Mr. Majeski suggested that a uniform method of backpacking might be more helpful

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Midland Plant, Units 1 & 2  
Consumers Power Company

Held at Midland Site  
Midland, Michigan  
May 14, 1984

in assuring that the backpacking is performed consistently in an adequate manner. (Item 79-34 remains OPEN) (OPINION ITEM)

Item 87-4 - Upper Leveling Plates.

Mr. Benvie asked if the FCR revising welding requirements for the upper leveling and bearing plate assemblies will be issued prior to installation of this assembly at the E17 pier. J. Kelleher responded that the forecasted issuance date for the FCR will allow use of the revised welding requirements for the E17 pier. (Item 79-26 remains OPEN) (INFORMATION ITEM)

New Items

Item 87-5 - SWEC Report - "Evaluation of Change and Nonconformance Documents."

P. Majeski stated that followup of the recommendations contained in the SWEC report entitled "Evaluation of Change and Nonconformance Documents" will be reviewed by the Assessment Team in the near future. The recommendations contained in the reports are associated with NCR trending, NCR and FCR process times, development of a QAP task force and availability of engineering support on site. (INFORMATION ITEM)

Item 87-6 - Implementation of the QAP Task Force Recommendations.

P. Majeski requested the status of C P Co implementation of the QAP Task Force recommendations. These recommendations include revisions to selected PQCI's, construction procedures, and specifications to facilitate construction and inspection of various processes. Also, guidelines for developing future PQCI's, construction procedures and specifications associated with new construction areas are included in the task force recommendations. G. Murray will respond. (OPEN ITEM)

Item 87-7 - MPQAD Inspection Report Review.

P. Majeski requested the status of the review being conducted of MPQAD inspection reports for Remedial Soils work performed prior to 9/82. R. Sevo will respond. (OPEN ITEM)

Item 87-8 - Revised Loading Schedule for the E/W17 Piers.

J. Oliveira requested that the Contractor provide details of the revised loading schedule associated with the enlarged straight shafted design for piers E/W17. J. Fisher will respond. (OPEN ITEM)

Item 87-9 - Concrete Placement Schedule for the Permanent Auxiliary Building Underpinning Wall.

D. Zito asked for a schedule detailing monthly concrete placement quantities planned during construction of the permanent wall for the Auxiliary Building. J. Fisher will respond. (OPEN ITEM)

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Item 87-10 - Reverification of Previously Mapped Cracks at the BWSTs.

D. Zito requested results of the reverification survey on previously mapped cracks at the BWSTs. E. Cvikl will respond. (OPEN ITEM)

Item 87-11 - Reserve Capacity Loading for Piers CT 1/12.

E. Cvikl stated that jacking for input of reserve capacity loading (RCL) at piers CT 1/12 was performed this weekend. Lift off was attained at 120% of the specified load. Both piers were loaded to 150% of design load and locked off. (INFORMATION ITEM)

Response Items

No response items were addressed.



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

Held at Midland Site  
Midland, Michigan  
May 15, 1984

Present For:

Consumers Power

G. Murray

Bechtel

J. Fisher  
J. Kelleher  
E. Cviki

MPQAD

R. Sevo  
J. McMaster

Stone & Webster

D. Benvie  
D. Zito  
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 87-12 - Auxiliary Building Underpinning Activities.

Installation of expansion anchors for the pier E17 upper bearing and leveling plate assembly has begun.

Placement of grout pads for the W5 grillage support columns in the drop pit was completed.

(INFORMATION ITEM)

Item 87-13 - SWPS Backpacking Material and Method.

J. Fisher discussed backpacking modifications for the SWPS access shaft. During installation of lagging, clay will be placed beneath the bottom of each lagging piece and the remaining area behind the lagging will be back-packed with sand. Previously, it was stated that clay would only be placed at the bottom of every second or third lagging. Excelsior will be placed on an as needed basis in the spaces between the lagging. (Item 79-28 and 79-34 remains OPEN) (INFORMATION ITEM)

Item 87-14 - Revised Loading Schedule for the E/W17 Piers.

J. Kelleher provided the Assessment Team with a copy of the revised loading schedule for the redesigned E/W17 piers. (Item 87-8 remains OPEN) (INFORMATION ITEM)

New Items

Item 87-15 - Excavation Conveyor at the SWPS.

J. Oliveira asked for the manufacturers technical data associated with the requirements for the paddle blade angle on the excavation conveyor. It was noted that the conveyor may have been set up at too high an angle to allow proper transport of excavated soil. (OPEN ITEM)

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Midland Plant, Units 1 & 2  
Consumers Power Company

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Midland , Michigan  
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Item 87-16 - Weldcrete.

E. Cvikl reported that weldcrete will not be used for any applications related to the underpinning. The decision not to use weldcrete is based on a concern with its use in a moist environment. It had previously been stated that weldcrete would be used for temporary underpinning applications. (INFORMATION ITEM)

Item 87-17 - Installation of Expansion Anchors in Lean Concrete.

D. Benvie noted that installation of expansion anchors in lean concrete for the Kc5 drift supports had resulted in issuance of an NCR. The NCR was written because procedural requirements only address installation of expansion anchors in structural concrete. Mr. Benvie asked if the procedures will be revised to include installation of expansion anchors in fill concrete. J. Kelleher replied that all expansion anchors are required to be installed in structural concrete. This requirement is to ensure the load carrying ability of the expansion anchors. As a result, no procedural change will be made. The disposition for the NCR written to address the Kc5 drift support expansion anchors installed in the lean concrete will require that these expansion anchors be reinforced to meet design requirements. (CLOSED ITEM)

Response Items

Item 87-18 - Auxiliary Building Access Shaft Grout Shims.

E. Cvikl responded to the Assessment Teams question concerning use of grout shims for the wales in the Auxiliary Building access shafts. Engineering has reviewed the use of grout shims at the interface of the wale and applicable piers. The possible effects of grout shrinkage and equipment vibrations on the grout shims were evaluated. As a result, the shims used for the E/W10 pier struts will be constructed of steel instead of grout. (CLOSES ITEM 85-29)

Item 87-19 - MPQAD Inspection Report Review.

J. McMaster discussed the review of MPQAD inspection reports for underpinning work performed prior to 9/82. Certification of inspectors to review these inspection reports is required. Once the inspectors have been certified, review of approximately 1300 inspection reports for underpinning work accomplished prior to 9/82 will be performed. It is expected that this review will be completed by the last quarter of this year. (CLOSES ITEM 87-7)

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Consumers Power Company

Held at Midland Site  
Midland, Michigan  
May 15, 1984

Item 87-20 - Concrete Placement Schedule for the Permanent Auxiliary  
Building Underpinning Wall.

J. Kelleher provided the Assessment Team with a copy of the schedule detailing monthly concrete placement quantities planned during construction of the permanent underpinning wall for the Auxiliary Building. (CLOSFS ITEM 87-9)

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

Held at Midland Site  
Midland, Michigan  
May 16, 1984

Present For:

<u>Consumers Power</u>	<u>Bechtel</u>	<u>MPQAD</u>	<u>Stone &amp; Webster</u>
G. Murray	J. Fisher J. Kelleher E. Cvikl	J. McMaster R. Sevo	D. Benvie L. Rouen 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 87-21 - Auxiliary Building Underpinning Activities.

Placement of grout was completed for the pier E17 lower leveling plate.  
Concrete placement for the W5 pier shaft was completed to El. 597'.

Excavation of the E5 pier shaft was completed .

(INFORMATION ITEM)

Item 87-22 - SWPS Underpinning Activities.

J. Fisher reported that installation of the lower level bracing for the soldier pile wall along the east side of the SWPS is scheduled to begin next week.  
(INFORMATION ITEM)

Item 87-23 - Concrete Placement at BWSTs Ring Beam Addition.

J. Fisher reported that concrete was placed yesterday for a portion of the ring beam addition at both BWSTs. (INFORMATION ITEM)

New Items

Item 87-24 - Control Tower Instrumentation Readings.

D. Benvie requested, that Resident Engineering provide the Assessment Team with instrumentation data associated with reserve capacity load jacking performed at piers CT 1/12 last weekend. E. Cvikl will respond. (OPEN ITEM)

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

Held at Midland Site  
Midland, Michigan  
May 16, 1984

Item 87-25 - Instrumentation Reading Schedule at the SWPS.

D. Benvie asked if an instrumentation reading schedule has been developed for monitoring SWPS building movement during filling of the service water bays. E. Cviki will respond. (OPEN ITEM)

Item 87-26 - West Buttress Access Shaft Footing.

J. Fisher reported that a crack in the west buttress access shaft footing has been found in the vicinity of the Level C Wales. The cause of cracking is presently under investigation. (INFORMATION ITEM)

Response Items

Item 87-27 - Revised Loading Schedule for the E/W17 Piers.

The Assessment Team has reviewed the revised loading schedule associated with the redesigned E/W17 piers. The schedule indicates that each middle pier will be loaded to 30 % of the specified design load. Once the concrete and grout for the two side piers constructed adjacent to each of the middle piers has attained the required compressive strength, the entire pier unit will be loaded in accordance with the original design requirements. The Assessment Team concludes that the loading sequence is appropriate for the redesigned piers. (CLOSES ITEM 87-8)

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Midland Plant, Units 1 & 2  
Consumers Power Company

Held at Midland Site  
Midland, Michigan  
May 17, 1984

No meeting was held on this date.

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

Held at Midland Site  
Midland, Michigan  
May 18, 1984

Present For;

Consumers Power

G. Murray

Bechtel

J. Fisher  
J. Kelleher  
J. Darby

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 87-28 - Auxiliary Building Underpinning Activities.

Concrete placement for pier E5 was completed to El. 597'.

Excavation of the Kc5 pier shaft to subgrade and installation of the ring beam was completed. Bell excavation is in progress.

Carlson meter installation was completed for the E/W5 piers.

Excavation of the pier shaft to the top of the bells and installation of the ring beam for piers CT 3/10 has been completed.

(INFORMATION ITEM)

Item 87-29 - Reverification of Previously Mapped Cracks at the BWSTs.

J. Darby stated that a report by Resident Engineering summarizing their reverification survey of previously mapped cracks at the BWSTs will be issued next week. (Item 87-10 remains OPEN) (INFORMATION ITEM)

New Items

Item 87-30 - FSO Controlled Document Review.

J. Fisher reported that the monthly review of the FSO controlled documents for May will be performed on 5/21/84. (INFORMATION ITEM)

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Consumers Power Company

Held at Midland Site  
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May 18, 1984

Item 87-31 - CCP/Soils Interface.

G. Murray provided the Assessment Team with a copy of the guidelines outlining interaction between FSO and Balance of Plant relating to CCP work. Contained in the guidelines are the responsibilities for performing and inspecting work activities where Balance of Plant work is affected by Remedial Soils work. (INFORMATION ITEM)

Item 87-32 - Inspection of SWPS Instrumentation.

W. Kilker asked what was the nature of the NCR written on welding inspection for the SWPS instrumentation. J. Darby and G. Murray stated welding inspection was not performed during installation of the instrumentation. An inspection of the instrumentation welding is scheduled for early next week to verify design compliance. (CLOSED ITEM)

Item 87-33 - Weekly Report # 86.

The text of Weekly Report # 86 was reviewed. It was determined that all open items had been previously identified. (INFORMATION ITEM)

Response Items

Item 87-34 - Instrumentation Reading Schedule.

J. Darby responded to the Assessment Team's question concerning reading of instruments during filling of the service water bays. It is planned to read the SWPS instruments just prior to filling of the bays and immediately after filling has been completed. Another reading will be taken 4 hours later. After this reading, the normal instrument reading schedule will be resumed. Instrumentation readings may be taken during the filling operation if time permits. (CLOSES ITEM 87-25)

Item 87-35 - Upper Leveling Plates.

J. Kelleher reported that the FCR revising welding requirements to reduce warping of the upper leveling and bearing plate assemblies has been issued. The FCR reduces the size of the welds required to fasten the leveling and bearing plates together from 0.5 in. to 0.25 in. The Assessment Team believes that reduction of the weld size will be effective in reducing the warping that has previously occurred with the upper leveling and bearing plate assembly. (CLOSES ITEM 79-26)