

STONE & WEBSTER ENGINEERING CORPORATION



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

January 18, 1983

J.O. NO. 14358
Ref. MFP 17

Attention Mr. R. Cook

RE: DOCKET NO. 50-329/330
Midland Plant - UNITS 1 and 2
INDEPENDENT ASSESSMENT OF AUXILIARY BUILDING UNDERPINNING
REPORT NO. 17

A copy of the Independent Assessment of the Auxiliary Building Underpinning Weekly Report No. 17 for the period January 9, 1983 through January 15, 1983, is enclosed with this letter. Included, as an attachment, are the minutes of the daily meetings held during the week between members of the Assessment Team and Site Engineering, Construction and Quality Assurance personnel.

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

Very truly yours,

A. Stanley Lucks

A. Stanley Lucks
Project Manager

Enclosures

ASL/ka

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JAN 21 1983

J. O. NO. 14358
Midland Plant
Units 1 and 2
Independent Assessment
Auxiliary Building Underpinning

Weekly Report No. 17

January 9, 1983 through January 15, 1983

Personnel on Site

Stone & Webster Engineering Corporation (SWEC)

W. Kilker	1/10 - 1/15
L. Rouen	1/10 - 1/14
A. Scott	1/10 - 1/15
S. Lucks	1/10 - 1/11

Parsons, Brinckerhoff, Quade and Douglas (PBQD)

J. Ratner	1/10 - 1/14
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Meetings Attended

<u>Date</u>	<u>Represented</u>	<u>Purpose</u>
1/10 through 1/14	Stone & Webster Bechtel Consumers Power Parsons	Daily Meetings
1/14	Stone & Webster Bechtel Consumers Power	Weekly Soils Review

Activites

Construction - Pier W12 was excavated and lagged to E1 581. The excavated material consisted of a mixture of brown sand and clay fill above E1 586 and natural gray clay below E1 586. Perched groundwater entered the excavation near E1 586 at a rate of 50-60 gallons/day. The water was encountered on January 12 and as of January 15, the rate of flow had remained relatively constant. The water was controlled by sump pumping from the bottom of the excavation during periods when the hole was not being advanced. During the excavating operation the water was simply removed as part of the excavated material. Because the seeping water was creating "muddy" working conditions in the bottom of the pier excavation, the subcontractor devised a plastic pipe trough attached to the lagging near E1 585 to divert the water directly to a collection barrel rather than allowing the water to drain to and disturb the clay at the bottom.

The excavation was alternately excavated approximately 18 inches and lagged throughout the fill material. Below the elevation of the natural clay, the excavation was advanced approximately 3½ ft. prior to initiating lagging placement.

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Backpacking of the lagging was done after the installation of each set in the fill and after installation of each spreader set (every 4th set) in the natural clay. The backpacking material was either the excavated brown fine sand fill or an imported medium grained sand.

The degree of backpacking required was minor since the excavated surfaces were being trimmed smooth and no collapsing of the soil was occurring. Excelsior was not used except near the southwest corner of the excavation, between E1 588 and 585 where the seepage of water between the lagging had begun to wash out a very minor quantity of fine sand. When the collection trough was installed a portion of the excelsior was removed and a cement grout packed into the lagging separation zone directly above the trough.

On January 14, a 4-6 inch thick concrete mud-mat was installed in the access pit and drift excavation of pier W12.

The access drift of pier E12 was advanced to completion - approximately 9 ft. under the outside edge of the turbine building. The excavation was mainly in lean mix concrete except for a wedge of clay fill along the west side. The concrete at the top of the drift was chipped away to the level of the turbine mat structural concrete, as determined by examination of core samples. Along the west side of the drift, the "stress relief" wedge was excavated in the clay fill just below the roof level. Clay fill soil was also encountered in the lower right corner of the face of the drift. This material was cut back on a flat slope commencing at the bottom of the face. No groundwater entered the drift excavation, although minor perched water continued to enter the sump in the adjacent access pit.

Quality Control, Documentation and Records -

1. Reviewed the qualification of the QC welding inspector performing the inspection of the pier W12 channel bracing.
2. Verified the proper implementation of the probing procedure for measuring groundwater at pier W12.
3. Reviewed the qualification records of the concrete batchplant inspector.
4. Witnessed the performance evaluation of a QC inspector by a Quality Assurance Engineer on the W12 drift excavation inspection plan.

5. Reviewed the completed QC Inspection Reports for the W12 pier excavation to date.
6. Reviewed two QC Inspection Reports on the fabrication of steel lagging.
7. Reviewed the QA "over-inspection" reports for the W12 drift and pier excavation for the last week of December and first 10 days of January.
8. Verified the development of strength vs time curves for the concrete mix designated for the W12 access pit and drift mud-mat.
9. Observed and inspected the mock-ups in the Poseyville storage area that will be used to aid in the performance evaluation of QC inspectors. The mock-up installations include an in-ground lagged pier excavation with reinforcing bars in-place, an above-ground pier bell with bracing and bottom reinforcing steel, and concrete anchor and anchor drill hole installations.
10. Witnessed the performance evaluation at the mock-up area of a QC inspector by a QA engineer on the pier lagging procedure.

Observations

Construction - The Team determined that the construction practices employed to advance the W12 pier excavation and the E12 access drift excavation were in compliance with the project documents.

On the W12 pier excavation, care was taken to accurately trim the soil, to maintain the overall verticality of the shaft, to control and remove perched water seepage and to minimize the movement of fines and fine sand into the excavation by the use of excelsior packing where required. The Team did observe that backpacking was difficult due to the narrow 1 inch spacing between lagging sets. The inspection of the effectiveness of the backpacking is also difficult. However, due to the care being exercised in trimming the excavation prior to installation of the lagging, this does not represent a problem.

On the E12 access drift, the contractor did a thorough investigation to determine the junction of the turbine mat structural concrete with mud-mat concrete.

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Quality Control, Documentation and Records - The Team surveillance indicated the MPQAD organization has adequately performed and documented the inspections, training, qualifications and overview assessments.

In the opinion of the Assessment Team, the concept of partial training of the QC personnel at the mock-up area, is worthwhile. It not only results in a more efficient training schedule, but permits the QA examiner to test the ability of the QC inspector to detect "built-in" errors.

The Team advised MPQAD that although the Inspection Reports produced to date by the field personnel are in good order, the final sign-off of these documents by supervisory personnel should be accomplished more efficiently.

Non-Conformance Identification Reports

Status of previous issues: (NIR numbers no longer listed have been closed-out during previous weeks.)

<u>NIR No.</u>	<u>Description</u>	<u>Date</u> (Opened)	(Closed)
3	Coupler Testing Temperature	12/2/82	*
4	Welding Qualifi- cation Procedure	12/29/82	

* A reply has been received and is being reviewed.

W. E. Miller
Project Engineer

A. S. Smith
Project Manager

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: January 10, 1983

Attendees:	<u>Bechtel</u>	<u>Stone/Webster</u>	<u>MPQAD</u>	<u>CPCo</u>
	J. Fisher	W. Kilker	L. Kettren	G. Murray
	E. Cvikl	A. Scott		
		A. Lucks		
		<u>Parsons</u>		
		J. Ratner		

1. L. Kettren reported that a list of shop drawings requiring Engineering approval has been compiled. Copies of the list were distributed.
2. W. Kilker said that J. Ratner discussed the backpacking of the west wall of the access drift lagging with M. Lewis (FSO) on January 8, 1983.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: January 11, 1983

Attendees:	<u>Bechtel</u>	<u>Stone/Webster</u>	<u>MPQAD</u>	<u>CPCo</u>
	J. Fisher	A. Scott	D. Oliver	G. Murray
	E. Cvikl	J. Ratner		
	D. Lavelle	L. Rouen		

1. R. Oliver reported that MPQAD comments on completed access pit and drift installations are included on their documentation reports. D. Lavelle said construction will conduct a review for any possible improvements.
2. J. Fisher stated that MIOSHA had some observation based on their recent inspection of the construction improve barriers around access pits, modify hoist cable and protect floodlights.
3. The second shift for the West Pier will commence once bell level is reached - tentatively January 17, 1983.
4. E. Cvikl said Engineering is preparing to answer the Assessment Team NIR #3 on the testing temperature of couplers.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: January 12, 1983

Attendees:	<u>Bechtel</u>	<u>Stone/Webster</u>	<u>MPQAD</u>	<u>CPCo</u>
	J. Fisher	L. Rouen	R. Sevo	R. Wieland
	E. Cvikl	A. Scott		
	D. Lavelle	W. Kilker		
		<u>Parsons</u>		
		J. Ratner		

1. E. Cvikl and J. Fisher described the conversation engineering had with NRC with respect to backpacking. Backpacking as stipulated in the procedures will continue to be adhered to.
2. R. Sevo reported that QA has established mock-ups of a lagged excavation, a pier bell and concrete bolt installation in order to conduct QC performance evaluation on certain of the Quality Control Plans.
3. D. Lavelle said engineering is conducting a review of drawings, specifications and procedures for piers E-W 9 and 11 to assure agreement between documents.
4. R. Wieland will verify requirements on resuscitators for inspection after work hours.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: January 13, 1983

Attendees:	<u>Bechtel</u>	<u>Stone/Webster</u>	<u>MPQAD</u>	<u>CPCo</u>
	J. Fisher	L. Rouen	L. Kettren	G. Murray
	E. Cvikl	A. Scott		
		W. Kilker		
		<u>Parsons</u>		
		J. Ratner		

1. W. Kilker and J. Ratner described the observation of January 12, 1983 concerning the difficulty of backpacking and inspecting the degree of backpacking with the present spacer size on the pier lagging. There was no concern over the quality of the lagging/backpacking work.
2. E. Cvikl reported that engineering is preparing the response to the team NIR #3.
3. L. Rouen questioned if the mud-mat placement in pier W12 would impact the NRC written on welding of the bracing channel. J. Fisher replied there would be no interference since the mat wouldn't come up to the level of the channel.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: January 14, 1983

Attendees:	<u>Bechtel</u>	<u>Stone/Webster</u>	<u>MPQAD</u>	<u>CPCo</u>
	J. Fisher	L. Rouen	-----	G. Murray
	E. Cvikl	A. Scott		
		W. Kilker		
		<u>Parsons</u>		
		J. Ratner		

1. Mud-mat in W12 access drift will be placed at 5:00 PM today.
2. J. Fisher advised that pier excavation will begin to advance 42 inches in the clay prior to lagging installation.