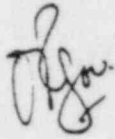




UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

NOV 18 1983

MEMORANDUM FOR: George Lear, Chief
Structural and Geotechnical Engineering Branch
Division of Engineering

THRU:  Pao-Tsin Kuo, Leader
Structural Engineering Section B
Structural and Geotechnical Engineering Branch
Division of Engineering

FROM: Frank Rinaldi, Structural Engineer
Structural Engineering Section B
Structural and Geotechnical Engineering Branch
Division of Engineering

SUBJECT: EVALUATION OF EVIDENCE ON DIESEL GENERATOR BUILDING -
MIDLAND PROJECT FOR DETERMINATION OF NEED TO REOPEN HEARINGS

Pursuant to your request of November 8, 1983, for my evaluation of any new evidence related to the structural adequacy of the Diesel Generator Building (DGB), I have evaluated the report by the NRR Task Group dated October 21, 1983, for the test conditions provided by your management (Enclosure 1) and expanded by the staff attorney (Enclosure 2).

Foremost, I like to state that the NRC staff decision to reopen the hearings on the DGB lies on the NRC legal staff. The NRC legal staff is aware of the official staff position and personal technical positions of staff members and consultants, as stated in written and oral testimony during the ASLB hearing of December, 1982. In addition, the NRC legal staff is aware of the questions raised by the Region III-IE inspector as well as the answers provided by all concerned parties. Indeed the NRR Task Group Report of October 21, 1982, documents the conclusions, discussions, and specific answers to the questions raised by Region III-IE inspector. The NRR Task Group report includes their findings, those of their consultant staff from Brookhaven National Laboratory (BNL), as well as the replies by NRR Structural and Geotechnical staff and their consultants to the questions raised by the Region III-IE inspector. Please note that errata has been pointed out to the Task Group. The need for corrections has been acknowledged by the Task Group and errata pages have been issued.

Recognizing the fact that my recommendations on the subject of reopening the hearing for the DGB are needed for the final decision making, I will identify the important facts stated by the Task Group and state if they constitute, from the structural engineering point of view, new evidence or if they impact on the previous conclusions reached by the structural engineering staff. The major points are the following:

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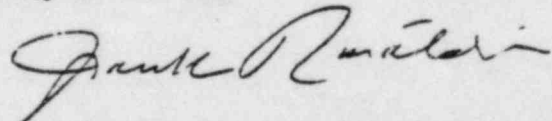
1. The Task Group used the same facts and evidence used by the review staff in their evaluation of the DGB.
2. The Task Group reached the same bottom line conclusion, "that there is reasonable assurance that the structural integrity of the DGB will be maintained and its functional requirements fulfilled."
3. The Task Group concluded that, "The most reasonable estimate of stress due to settlement is based on the crack width data. However, the calculations that have been done in this area need to be completely documented."
4. The Task Group stated, "That a more accurate and reliable crack monitoring program be established," and that sufficient stress margins for Action Level and specific repairs be established for Alert Level of crack/s width/s. Also, they recommended a general repair program prior to plant operation.

The first two items are self-explanatory and from a structural engineering technical point of view should be the major reasons that no additional hearings are required to establish the structural adequacy of the DGB. The third item asks for the documentation of the calculations used in the determination of the conservative stress values utilizing the crack width data. The approach has been discussed, the results have been documented, and the data used for the calculations has been identified. Therefore the requested documentation will consist of nothing more than presenting the information related to the assumptions made, formula used, input data, calculations, and results. The actual calculations require basic skills and engineering judgment. The resulting stress values can be easily verified with the stress results identified in the written and oral testimony of the applicant and the staff. I do not consider this documentation to be new evidence because the facts do not change. The fourth item recommends a modification to the monitoring program previously proposed by the applicant and accepted by the staff and a general repair program. The Task Group does not provide specific approaches that would fulfill these recommendations. BNL report recommends the extensive use of Whitmore strain gages in place of the three crack monitoring windows currently accepted by the staff, but recommends the same general approaches as the Task Group for requirements on the general repairs and the requirements on the Alert and Action Levels. The Task Group was aware of the BNL recommendation related to the Whitmore strain gages, but did not make such firm recommendation. The above stated facts lead me to the conclusion that the Task Group is leaving the structural review staff and the applicant with the task of resolving these concerns.

NOV 18 1983

I conclude from my review of the Task Group report that the NRC staff needs to start discussions with the applicant concerning the documentation of the rebar stresses as determined from all available crack-width data, the usefulness and effectiveness of the strain gages proposed by BNL, and if more specific actions should be established now, or as results of meetings with the applicant after the alert and/or action levels are reached. The applicant has contracted with Portland Cement Association (PCA) to review and evaluate all field data (cracks and deflections) to evaluate potential and specific problems identified by the monitoring program. The staff was relying on this independent monitoring and evaluation by PCA in the acceptance of the monitoring requirements.

I understand the fact that some people may not fully understand the structural engineering technical aspects of this case and may consider the availability of any new document as solid ground for reopening the hearings on the DGB. However, based on the fact that no new evidence was uncovered in the preparation of the conclusions of the Task Group, that the structural adequacy of the DGB was assured, and that no specific detailed recommendations were made other than generic suggestions which the staff can request the applicant to resolve and then inform the board of the resolutions; I do not recommend, from the structural engineering technical point of view, to reopen the hearing on the structural safety of the DGB.



Frank Rinaldi, Structural Engineer
Structural Engineering Section B
Structural and Geotechnical
Engineering Branch
Division of Engineering

Enclosures:
As stated

cc: R. Vollmer
J. Knight
T. Novak
T. Sullivan
E. Adensam
D. Hood
W. Paton
P. Kuo
L. Heller
J. Kane
G. Harstead
J. Matra
F. Rinaldi

Test to apply in deciding whether to recommend that the hearing be reopened.

- Is there new evidence that modifies the evidence of record?
For example, does the new evidence affect what was said by the witnesses (any or all) in such a way that something different would have been said if the information had been available before the testimony was given?

- The issue is one of "fairness to the board". If our feeling is that the evidence would not change our conclusions but that the board nevertheless, should have the benefit of reviewing this new evidence to reach its conclusions, then we should recommend for reopening the record.

ENCLOSURE 1

Are the facts or expert opinions in the DGB Task Report that are different from facts or expert opinions now in evidence before the Licensing Board. (The facts and expert opinions referred to are significant facts and expert opinions, i. e. - facts and expert opinions that could effect a conclusion with respect to the structural adequacy of the Diesel Generator Building)

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November 23, 1983

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✓	ENR	ASST. DIR.	
	INSPECTION		
	REG.		
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	SCS		
	ML		
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Docket Nos. 50-329 OM, OL
and 50-330 OM, OL

MEMORANDUM FOR: The Atomic Safety and Licensing Board for the Midland
Plant, Units 1 and 2

FROM: Thomas M. Novak, Assistant Director for Licensing
Division of Licensing

SUBJECT: CORRECTIONS TO REPORT ON RE-REVIEW OF THE MIDLAND
DIESEL GENERATOR BUILDING (BN 83-165A)

Board Notification 83-165 transmitted a report by a team of NRC structural engineers and consultants addressing the structural adequacy of the Midland Diesel Generator Building. Enclosed for your information is a memorandum from Dr. P. T. Kuo, team leader, containing four corrected pages for that report. Holders of the report are requested to remove pages 9, 17, 20 and AII-4, and insert the corresponding corrected pages.

Thomas M. Novak, Assistant Director
for Licensing
Division of Licensing

Enclosure:
P. T. Kuo memo dated
November 14, 1983

cc See next page

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DEC 1 1983

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Docket Nos. 50-329/320

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UNITED STATES
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NOV 14 1983

MEMORANDUM FOR: James P. Knight, Assistant Director
for Components & Structures Engineering
Division of Engineering

FROM: Pao-Tsin Kuo, Section Leader
Structural Engineering Section B
Structural & Geotechnical Engineering Branch
Division of Engineering

SUBJECT: ERRATA PAGES - REPORT ON THE REVIEW OF THE DIESEL
GENERATOR BUILDING

Enclosed are corrected pages 9, 17 and 20 of the report and page 4 of Appendix II to the report. Please remove from the report the affected pages and insert the enclosed corrected pages.

Pao-Tsin Kuo

Pao-Tsin Kuo, Section Leader
Structural Engineering Section B
Structural & Geotechnical
Engineering Branch
Division of Engineering

Enclosure:
As stated

cc w/encl:
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D. Eisenhut
R. Vollmer
G. Lear
D. Hood
W. Paton
N. Romney
C. Tan
R. Lardsman, RIII
F. Rinaldi
J. Kane

Contact: C. P. Tan, SGEB
X28424
N. D. Romney, SGEB
X28987

~~8311298183~~

analysis of a single through crack in a subsection of the east wall of the DGB by using the Automatic Dynamic Incremental Non-linear Analysis (ADINA) computer program. The purpose of this analysis was to evaluate the ultimate capacity of a concrete section containing a single crack. As such, the results of the analysis are of only limited value in assessing the effects of the cracks. As a further attempt to resolve the concerns on cracking, the Applicant sought the opinion of Professor M. A. Sozen of the University of Illinois. On the basis of the crack patterns and crack-size, Prof. Sozen estimated the stresses in the rebar across the cracks to be in the range of 20 to 30 ksi.

The structural engineering staff reviewer also made his own assessment by combining the rebar stresses estimated from crack widths with stresses resulting from the Applicant's analyses for other operating loads. It showed that the resultant stress was within the acceptance criteria (Tr. 11086).

In order to assure the structural integrity of the DGB, the Applicant has proposed a crack monitoring and evaluation program to be used during the life of the DGB, in addition to an initial repair program. Specific acceptance criteria (i.e. alert limits and action limits) for crack width and crack width increases have been established by the Applicant and approved by the structural engineering staff reviewer.

of dead, live, tornado and earthquake loads, and therefore it is expected to be able to resist these loads and their loading combinations with adequate margins of safety as designed. However, as a result of settlement which was not considered in the original design, the margins of safety have been reduced to some extent and there is some uncertainty as to its capability to resist the design loads. The purpose of monitoring the cracks is to insure that if there is any change in the condition of the structure it will be observed and appropriate actions can be taken, if necessary. The structural engineering staff reviewer has accepted the Applicant's proposed crack size criteria and corrective action to be taken when the allowed sizes are exceeded. The Task Group is of the opinion that, while the approach is reasonable, details of the program should be further examined and improved. It should also be noted that the crack monitoring program should be in complement with a settlement monitoring program, since any assessment based on either of the two monitoring programs alone may be misleading.

6. AN ASSESSMENT OF THE DGB

Before assessing the structural adequacy of the DGB, let us examine general characteristics of structures in their capability to adapt to the settlement of the foundation soil. Structures may be classified as highly flexible, practically flexible, highly rigid and practically

The DGB design, as indicated by Applicant's analyses, is controlled by the tornado wind. Under such a load, especially the postulated internal pressure, the full strength of the walls will be mobilized, and there will be a redistribution of the load, if there exist localized high stress areas. This will also be true if the seismic loads are considered. One can make such judgments on the basis of the observation that the DGB is a highly redundant structure. The structural elements are not columns and beams. They are heavy reinforced concrete walls and slabs. With necessary repair work to be done and with adequate monitoring programs, there is reasonable assurance that the structural integrity of the DGB will be maintained and its functional requirement will be fulfilled.

7. CONCLUSIONS AND RECOMMENDATION

Most of our conclusions have been expressed in our comments to the concerns. They may be summarized as follows:

1. Analyses of the DGB either by linearizing the settlements or by applying the settlements as measured render unrealistic results. The stresses due to settlement are either underestimated or overestimated. A realistic analysis would be one which simulates the stage-by-stage construction of the DGB, and uses the actual and more detailed settlement measurements at each stage. However, such settlement history for the DGB does not exist. For this reason, the Task Group believes that a rigorous analysis to compute rebar stresses is unattainable.

He indicated that there was not sufficient settlement data points to make a reasonable stress analysis. To obtain the required input, Mr. Matra stated that he linearly interpolated between the measured settlement data points. As expected there was extremely high stress in areas where no cracks in concrete were observed. Both Dr. Harstead and Mr. Matra mentioned that stresses depended on higher order derivatives. These higher order derivatives cannot be determined accurately from the five measured data points. Mr. Rinaldi indicated the most appropriate method of estimating rebar stresses due to settlement was to estimate stresses from crack widths. This method produced rebar stresses that ranged from 3.2 to 27.6 ksi which when added to the stresses from the controlling load cases was less than the 54 ksi allowable. Mr. Rinaldi described the crack monitoring program the Applicant agreed to (0.05"/10' as alert limit and 0.06" or 0.020"/10' as action limit). Finally, Mr. Rinaldi and Mr. Matra indicated that the controlling load case for the DGB was tornado depressurization which assumed the DGB to be unvented which is conservative considering the building is vented. Mr. Rinaldi documented his response to Landsman's concerns in a memo in Attachment 3.

Task Group Audit of Design Calculation

The Task Group visited the Bechtel, Ann Arbor, Michigan offices on September 12 and 13, 1983. The purpose of the visit was to conduct an audit of the structural design calculations of the Midland DGB.



UNITED STATES
 NUCLEAR REGULATORY COMMISSION
 WASHINGTON, D. C. 20555

November 21, 1983

DM *2d Oct. file*

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RC		DRMA
FAO		SCS <i>orig + 3</i>
EA		ML
FE		File <i>DM</i>

Docket Nos: 50-329 OM, OL
 and 50-330 OM, OL

MEMORANDUM FOR: The Atomic Safety and Licensing Board for
 the Midland Plant, Units 1 and 2

FROM: Thomas M. Novak, Assistant Director
 for Licensing
 Division of Licensing

SUBJECT: BOARD NOTIFICATION - STOP WORK ORDER ON PROJECT
 QUALITY CONTROL INSTRUCTIONS REGARDING ELECTRICAL
 INSTRUMENTATION SUPPORT WELDS (BN 83-181)

This Notification is provided in accordance with NRC procedures regarding Board Notifications and is deemed to provide new information material and relevant to quality assurance/quality control issues in the Midland OM-OL proceeding. As noted in Enclosure 1, Consumers Power Company (the Applicant) issued a stop work order on November 3, 1983, because of duplicate welding criteria contained within eight Project Quality Control Instructions (PQCI) used to control inspections of support welds for electrical instrumentation. A concern arises from the potential that, if a PQCI is revised, not all other PQCI with duplicate welding criteria may be revised accordingly. In such a case, inspections could be performed to requirements which should have been superceded.

Initiation of phase I of the Applicant's Construction Completion Program (CCP) with respect to inspection of electrical inspection support welds could be affected by this stop work order in the future. At present, however, no work is being, nor has been performed because of earlier stop work orders reported by BN 83-167. The NRC staff and Stone and Webster, the third party overviewer of the CCP, will monitor the Applicant's corrective actions regarding the eight PQCI. The staff will report further to the Board as resolutions are achieved.

DM Novak
 Thomas M. Novak, Assistant Director
 for Licensing
 Division of Licensing

Enclosure:
 R. Warnick memo dated
 November 8, 1983

cc: See next page

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NOV 28 1983

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NOV 08 1983

MEMORANDUM FOR: D. G. Eisenhut, Director, Division of Licensing, NRR
 FROM: R. F. Warnick, Director, Office of Special Cases
 SUBJECT: RECOMMENDATION FOR NOTIFICATION OF LICENSING BOARD

In accordance with present NRC procedures regarding Board Notifications, the following information is being provided as constituting new information relevant and material to the Midland OM/OL proceedings. This information deals with the licensee's November 3, 1983, decision to issue a stop work order pertaining to eight Project Quality Control Instructions (PQCI's) which control the inspection of electrical instrumentation support welds.

The eight PQCI's contain duplicate welding criteria. The potential exists that if a PQCI was revised, then all other PQCI's having duplicate welding criteria may not be revised. As a result, inspections could be performed to superceded requirements. This issue was identified by Stone and Webster during their overview of the Construction Completion Program (CCP).

No work was being performed which was affected by the stop work order, however, the order will prevent the licensee from initiating phase 1 of the CCP as it relates to the inspection of electrical instrumentation support welds until corrective actions have been taken and the stop work order rescinded.

If you have any questions or desire further information regarding this matter, please call me.

RF Warnick

R. F. Warnick, Director
 Office of Special Cases

AND

1:

BJE

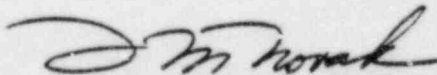
per
 July
 1983

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Paragraphs e and g of Enclosure 1 call into question 1) what should be the upward movements of the structures during jacking operations and 2) whether or not the stresses due to settlements prior to and during underpinning construction can be completely jacked out of the completed structure. With respect to the upward movements, the staff understands that the east EPA has been jacked to 91 mils of upward movement and the west EPA has been jacked to 70 mils. Upward movement in excess of 30 mils has not been reviewed by the staff. On the issue of stresses due to settlement, and underpinning operations, the allowable jacking loads are limited by a concern for redistribution of stresses following upward movement of the structures. The applicant's analysis, relied upon by the staff, assumed no significant residual stress due to earlier settlements for the completed underpinned structure and, therefore, may not be sufficiently conservative. We understand that Region III has verbally imposed a hold on further jacking in excess of that previously reviewed by the NRC staff pending establishment of allowable jacking limits.

The issues associated with this and other information from the September design audit are presently being reviewed by NRR in accordance with R. Warnick's request by Enclosure 1. The staff's response to Enclosure 1, once available, will be provided to the Board.



Thomas M. Novak, Assistant Director
for Licensing
Division of Licensing

Attachment:

R. Warnick memo dated October 11,
1983.

cc: See next page

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UNITED STATES
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OCT 1 1 1983

MEMORANDUM FOR: D. G. Eisenhut, Director, Division of Licensing, NRR
FROM: R. F. Warnick, Director, Office of Special Cases
SUBJECT: NRC AUXILIARY BUILDING AUDIT

On September 14 and 15, 1983, an NRC team comprised of Messrs. J. Kane and F. Rinaldi of NRR; Mr. R. Landsman of RIII and Consultants S. Poulous and G. Harstead, audited the licensee reanalysis of the Midland Auxiliary Building. This audit was performed at the Bechtel Office in Ann Arbor, Michigan. As a result of the audit, the team identified several design concerns and issues requiring resolution. These are referred to the Office of Nuclear Reactor Regulation for action as appropriate.

- a. The design of the remedial soils slab fix at Elev. 659 (i.e. the eye bars) was performed to ACI 318 and not to ACI 349. The acceptability of the licensee's decision to use ACI 318 in lieu of ACI 349 needs to be evaluated.
- b. In view of the critical nature of the eye bars, the question arose as to the need for some type of monitoring on this fix (i.e. strain gages) due to the anticipated settlement over the life of the plant. Do monitoring requirements need to be imposed?
- c. Because of the anticipated differential settlement expected to occur during the life of the plant, the control tower will be pulling away from the main auxiliary building. Has the mechanical branch determined that equipment between the two buildings can withstand this elongation?
- d. The licensee performed an analysis on differential settlement of the buildings that was different from that which the NRC anticipated. The staff expected the differential settlement to be measured between the edge of the main auxiliary building and the edge of the control tower. In reality, the licensee performed an analysis using the center of the main auxiliary building as one point instead of the edge. Thus, for the requested 0.25" differential settlement analysis, the actual value was 0.17", and for the requested 0.50" differential, the actual value was 0.24". Is the licensee's analysis acceptable to NRR?
- e. There appears to be a lot of confusion as to what upward building movements the licensee and NRC staff should allow during underpinning. What are the allowable upward movements during jacking operations?
- f. The licensee stated that existing structures were analyzed according to ACI 318 as agreed to with NRR. The SSER #2 states that the buildings have been checked against ACI 349. Is this acceptable to NRR?

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OCT 11 1983

- g. The analysis of the existing structures has been performed by assuming that the existing settlement stresses will be removed during the permanent underpinning jacking. The audit team feels that the existing stresses cannot be jacked out in their entirety and must be included in the final analysis of the building. What is the NRC position in regards to including existing settlement stresses in the analysis?

Should you or members of your staff need additional information, please feel free to contact R. Landsman (388-5587).

RFWarnick

R. F. Warnick, Director
Office of Special Cases

cc: J. C. Stone, IE
E. G. Adensam, NRR
J. D. Kane, NRR
F. Rinaldi, NRR

NOV 08 1983

~~Open~~
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midland

MEMORANDUM FOR: D. G. Eisenhut, Director, Division of Licensing, NRR
FROM: R. F. Warnick, Director, Office of Special Cases
SUBJECT: RECOMMENDATION FOR NOTIFICATION OF LICENSING BOARD

In accordance with present NRC procedures regarding Board Notifications, the following information is being provided as constituting new information relevant and material to the Midland OM/OL proceedings. This information deals with the licensee's November 3, 1983, decision to issue a stop work order pertaining to eight Project Quality Control Instructions (PQCI's) which control the inspection of electrical instrumentation support welds.

The eight PQCI's contain duplicate welding criteria. The potential exists that if a PQCI was revised, then all other PQCI's having duplicate welding criteria may not be revised. As a result, inspections could be performed to superceded requirements. This issue was identified by Stone and Webster during their overview of the Construction Completion Program (CCP).

No work was being performed which was affected by the stop work order, however, the order will prevent the licensee from initiating phase 1 of the CCP as it relates to the inspection of electrical instrumentation support welds until corrective actions have been taken and the stop work order rescinded.

If you have any questions or desire further information regarding this matter, please call me.

"Original signed by R. F. Warnick"

R. F. Warnick, Director
Office of Special Cases

RIII
JA
Gardner/lr
11/07/83

RIII
JA
Harrison
11/07/83

RIII
RFW
Warnick

~~8311280464~~



UNITED STATES
 NUCLEAR REGULATORY COMMISSION
 WASHINGTON, D. C. 20555

October 28, 1983

Docket Nos.: 50-329 OM, OL
 and 50-330 OM, OL

Midland BN file

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SGA	ML
ENF	File

MEMORANDUM FOR: The Atomic Safety and Licensing Board for the Midland Plant, Units 1 and 2

FROM: Thomas M. Novak, Assistant Director for Licensing
 Division of Licensing

SUBJECT: BOARD NOTIFICATION ON NINE STOP WORK ORDERS DUE TO DESIGN DOCUMENT CONTROL PROBLEMS (BN 83-167)

This Notification is provided in accordance with NRC procedures regarding Board Notifications and is deemed to provide new information relevant and material to quality assurance issues in the Midland OM/OL proceedings.

Enclosure 1 notes that on October 22, 1983, Consumers Power Company (the applicant) stopped extensive safety-related activities at the Midland site by issuing nine stop work orders. The orders result from the applicant's audit which determined (1) that field design changes were not being identified on all applicable construction drawings, (2) that the effects of minor design changes on design criteria were not being recalculated, and (3) that the quality assurance organization was not reviewing design changes for non-safety-related work which might affect safety-related systems. The nine stop work orders cover procurement activities, testing, NSSS installation, piping and pipe support fabrication, remedial soils work, HVAC system installation, Bechtel quality control (QC) hanger reinspections, Bechtel QC activities, and Bechtel post-turnover activities.

The enclosure also note that the applicant's corrective action will involve an extensive documentation review and that the duration of this review has not yet been determined. Significant layoffs of workers are indicated.

The NRC will follow the applicant's corrective actions and will provide followup information to the Board as significant resolutions are achieved.

Thomas M. Novak, Assistant Director
 for Licensing
 Division of Licensing

Enclosure:
 As stated

8308310082

cc: Licensee/Boards Service List

NOV 7 1983

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Enclosure 1

UNITED STATES
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GLEN ELLYN, ILLINOIS 60137

OCT 25 1983

MEMORANDUM FOR: D. G. Eisenhut, Director, Division of Licensing, NRR
FROM: R. F. Warnick, Director, Office of Special Cases
SUBJECT: RECOMMENDATION FOR NOTIFICATION OF LICENSING BOARD

In accordance with present NRC procedures regarding Board Notifications, the following information is being provided as constituting new information relevant and material to the Midland OM/OL proceedings. This information deals with the licensee's October 22, 1983, decision to stop safety-related activities at the Midland site by issuing nine stop work orders. These were issued as the result of a quality assurance audit of the design document control system. The pertinent facts that relate to the stop work are as follows:

The stop work orders included procurement activities, testing, nuclear steam supply system installation, piping and pipe support fabrication, remedial soils work, heating, ventilating and air conditioning system installation, Bechtel quality control hanger reinspections, Bechtel quality control activities, and Bechtel post-turnover activities. Bechtel is the architect-engineer and principal site contractor. The licensee estimates 500 to 600 workers will be laid off as a result of the stop work orders.

The licensee's audit determined that field design changes were not being identified on all applicable construction drawings, that the effects of minor design changes on design criteria were not being recalculated, and that the quality assurance organization was not reviewing design changes for non-safety-related work which might affect safety-related systems.

The licensee's corrective action will involve the review of 30,000 field design change documents. Each document involves an average of 1.7 construction drawings. The licensee has not determined how long the document review will take.

If you have any questions or desire further information regarding this matter, please call me.

RF Warnick
R. F. Warnick, Director
Office of Special Cases

~~8311020375~~



UNITED STATES
 NUCLEAR REGULATORY COMMISSION
 WASHINGTON, D. C. 20555

October 28, 1983

Docket Nos: 50-329 OM, OL
 and 50-330 OM, OL

~~ORCEW~~
 @midland BN 30

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PAO	SCS
SGA	ML
ENF	File

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MEMORANDUM FOR: The Atomic Safety and Licensing Board
 for the Midland Plant, Units 1 and 2

FROM: Thomas M. Novak, Assistant Director
 for Licensing
 Division of Licensing

SUBJECT: BOARD NOTIFICATION REGARDING STOP WORK ON
 BABCOCK AND WILCOX'S PIPE HANGER AND SNUBBER
 ACTIVITIES (BN 83-162)

This Notification is provided for your information in accordance with NRC procedures regarding Board Notifications and is deemed to provide new information material and relevant to quality assurance issues in the Midland OM/OL proceeding. As stated in the enclosure, on October 5, 1983, Babcock and Wilcox (B&W) decided to stop all its seismic Class I pipe hanger and snubber activities and lay off 132 craft and support personnel. The decision resulted from inspections by Bechtel and B&W which identified various discrepancies in the manufacture and installation of hangers and a number of deficiencies, including welding and bolting problems.

The NRC plans to follow the corrective actions which will result from this stop-work order and will provide follow up information to the Board once completed.

Thomas M. Novak, Assistant Director
 for Licensing
 Division of Licensing

Enclosure:
 Memorandum from R. F. Warnick to
 D. G. Eisenhut dated October 17,
 1983

cc: SECY
 OPE
 OGC
 Parties to the Proceeding

~~8308310059~~

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**Consumers
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October 14, 1983

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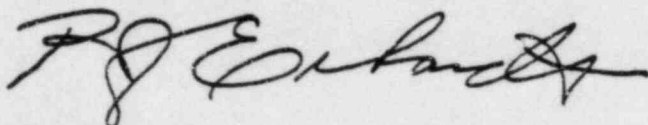
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ADDITIONAL INFORMATION REQUESTED BY NRC STAFF
AT THE TECHNICAL AUDIT OF THE DIESEL GENERATOR BUILDING
FILE: B3.0.3 SERIAL: 25867

This letter transmits to the NRC Staff the information requested at the September 12, 1983 Technical Audit of the Diesel Generator Building (DGB) in Ann Arbor, Michigan. The information provides a comparison of rebar stresses resulting from two analyses in which the forty-year estimated settlements (Settlement Case 2B) were performed on a finite-element model of the DGB. The model and the referenced settlement case were previously discussed by Mr Karl Wiedner at the Atomic Safety and Licensing Board (ASLB) hearing held on December 8 & 9, 1982.

Table 1 gives the stresses for settlements imposed at 10 boundary nodes around the DGB foundation; specifically, 5 nodes on the south wall, and 5 nodes on the north wall. These nodes are located at the intersection of cross walls with north and south walls. This analysis was performed for information purposes only and was carried out during April of 1982.

Table 2 gives stresses for the same settlement case as above, however, this time, settlement values were imposed at 66 boundary nodes around the DGB foundation. The settlement values were obtained by fitting smooth fourth-order polynomial curves through the same settlement values for the 10 node points on the north and south walls stated above. Likewise, this analysis was performed for information purposes only and at the suggestion of the NRC Staff during the aforementioned audit.

Tabulated rebar stresses for the majority of the elements for both cases are considerably in excess of the allowable value (54 ksi). For the elements with maximum stress values in the the same category the rebar stress values obtained from the second analysis (Table II) are consistently higher than those obtained from the first analysis (Table I).



RJE/MFC/bjw

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CONSUMERS POWER COMPANY
Midland Units 1 and 2
Docket No 50-329, 50-330

Letter Serial 25867 Dated October 14, 1983

At the request of the Commission and pursuant to the Atomic Energy Acts of 1954, and the Energy Reorganization Act of 1974, as amended and the Commission's Rules and Regulations thereunder, Consumers Power Company submits information requested by the NRC during the DGB audit held on September 12, 1983.

CONSUMERS POWER COMPANY

By /s/ R J Erhardt
R J Erhardt
Executive Manager - Midland Project

Sworn and subscribed before me this 17th day of October.

/s/ Alva C Robinson
Notary Public
Jackson County, Michigan

My Commission Expires October 1, 1986.

TABLE 1

129860

DIESEL GENERATOR BUILDING

Displacements imposed at 10 points around the bldg.

TABULATION OF MAX REBAR STRESSES FOR IMPOSING

GEOTECHS 40-YEAR DISPLACEMENTS. Settlement Case 2B

CATEGORY	ELEMENT	LOAD CASE	DIREN	AXIAL K/FT	MOMENT K-FT/FT	SHAPE K/FT	GRAD	REBAR STRESS	CONC STRESS
WEST WALL	43	1	VER	267.573	-19.318	95.990	0	170*	0.000
INTERIOR WALL	640	1	VER	136.897	0.529	-66.791	0	115*	0.000
EAST WALL	895	1	VERT.	141.973	17.367	43.310	0	101.943	0.000
NORTH WALL	102	1	VERT.	186.210	-25.266	-73.447	0	120*	0.000
SOUTH WALL	689	1	HOR.	276.429	17.415	122.949	0	175*	0.000
SLAB @ 664'-0"	377	1	E-W	31.358	2.387	-11.755	0	38.629	0.000
ROOF @ 620'-0"	353	1	E-W	65.495	1.268	28.860	0	42.500	0.000
SHIELD WALL NORTH	196	1	HOR.	29.455	8.453	21.334	0	15.859	0.000
SHIELD WALL (S) ABOVE EL 664'-0"	610	1	VERT	69.375	6.764	45.297	0	73.379	0.000
SHIELD WALL (S) BELOW EL 664'-0"	631	1	HOR	86.690	78.147	49.568	0	73*	0.000
INTERNAL SHIELD WALL	398	1	HOR.	0.864	0.190	1.853	0	5.766	0.000
BOX MISSILE SHIELD	739	1	VERT	32.054	0.626	-18.679	0	37.360	0.000

REFERENCE BSAP OUTPUT, CALC NO. 20-527-C1(Q)

REFERENCE OTRON OUTPUT, CALC NO. 20-527-C2(Q)

* STRESSES based on axial load only

TABLE 2

129860

DIESEL GENERATOR BUILDING

Displacements imposed at 66 points around the bldg

Tabulation of Max Rebar Stresses For
Enforced 40 yr settlements from 4th order curve.
(Settlement Case 2B)

DGB STRUCTURAL CATEGORY	ELEMENT NO.	LOAD CASE	REBAR DIR'N	AXIAL FORCE (K/FT)	BENDING MOMENT (FT-K/FT)	SHEAR FORCE (K/FT)	TEMP GRAD. (°F)	REBAR STRESS (KSI)	CONC. STRESS (KSI)
WEST WALL	36	1	Vert	201.627	-16.246	-84.206	0	173.036	0
INTERIOR WALL	641	1	Vert	107.829	4.254	-47.798	0	114.301	0
EAST WALL	895	1	Vert	467.989	34.162	88.293	0	244.584	0
NORTH WALL	766	1	Vert	408.619	-34.272	81.767	0	266.747	0
SOUTH WALL	716	1	Vert	416.466	9.614	-37.377	0	258.916	0
SLAB @ 664'-0"	178	1	E-W	60.995	2.283	1.152	0	72.177	0
ROOF @ 630'-0"	791	1	N-S	77.936	4.567	9.503	0	70.442	0
SHIELD WALL NORTH	839	1	Vert	58.894	12.754	-4.308	0	29.617	0
SHIELD WALL SOUTH ABOVE 664'-0"	610	1	Vert	92.365	8.273	61.632	0	108.295	0
SHIELD WALL SOUTH BELOW 664'-0"	631	1	Horiz.	119.811	95.726	70.239	0	230.620	0
INTERNAL SHIELD WALL	398	1	Horiz	6.888	.255	4.905	0	8.147	0
BOX MISSILE SHIELD	739	1	Vert	47.516	1.782	-16.197	0	56.657	0

Reference BSAP output DQ-52.12-C1 (Q), Rev 0
Reference OPTCON output DQ-52.12-C2 (Q), Rev 0

~~FILED~~
File-Bd
Not.

OCT 25 1983

MEMORANDUM FOR: D. G. Eisenhut, Director, Division of Licensing, NRR
FROM: R. F. Warnick, Director, Office of Special Cases
SUBJECT: RECOMMENDATION FOR NOTIFICATION OF LICENSING BOARD

In accordance with present NRC procedures regarding Board Notifications, the following information is being provided as constituting new information relevant and material to the Midland OM/OL proceedings. This information deals with the licensee's October 22, 1983, decision to stop safety-related activities at the Midland site by issuing nine stop work orders. These were issued as the result of a quality assurance audit of the design document control system. The pertinent facts that relate to the stop work are as follows:

The stop work orders included procurement activities, testing, nuclear steam supply system installation, piping and pipe support fabrication, remedial soils work, heating, ventilating and air conditioning system installation, Bechtel quality control hanger reinspections, Bechtel quality control activities, and Bechtel post-turnover activities. Bechtel is the architect-engineer and principal site contractor. The licensee estimates 500 to 600 workers will be laid off as a result of the stop work orders.

The licensee's audit determined that field design changes were not being identified on all applicable construction drawings, that the effects of minor design changes on design criteria were not being recalculated, and that the quality assurance organization was not reviewing design changes for non-safety-related work which might affect safety-related systems.

The licensee's corrective action will involve the review of 30,000 field design change documents. Each document involves an average of 1.7 construction drawings. The licensee has not determined how long the document review will take.

If you have any questions or desire further information regarding this matter, please call me.

"Original signed by R. F. Warnick"

R. F. Warnick, Director
Office of Special Cases

RIII
Landman/l
10/25/83

JJA
Gardner
10/25/83

JJA
Harrison
10/25/83

RFW
Warnick
10/25

~~8311020375~~



UNITED STATES
 NUCLEAR REGULATORY COMMISSION
 WASHINGTON, D. C. 20555

October 24, 1983

Docket Nos: 50-329 OM, OL
 and 50-330 OM, OL

~~ERTC~~
 Qm Bd not. Jul

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MEMORANDUM FOR: The Atomic Safety and Licensing Board for
 the Midland Plant, Units 1 and 2

FROM: Thomas M. Novak, Assistant Director
 for Licensing
 Division of Licensing

SUBJECT: BOARD NOTIFICATION - MIDLAND STOP WORK ORDER ON
 "Q" SOIL DRILLING (BN 83-155)

This Notification is provided in accordance with NRC procedures regarding Board Notifications and is deemed to provide information material and relevant to safety issues in the Midland OM/OL proceeding. As stated in the Enclosure, on September 28, 1983, the Consumers Power Company (CPCo) issued a stop work order on all "Q" soil drilling and pile driving after drilling into structural concrete. The stop work order shall remain in effect until CPCo implements action to correct this incident and to ensure no reoccurrence.

The NRC plans to follow CPCo's corrective actions and will provide follow up information to the Board when it becomes available.

Thomas M. Novak, Assistant Director
 for Licensing
 Division of Licensing

Enclosure
 Memorandum from R. F. Warnick to
 D. G. Eisenhut dated October 5,
 1983

cc: See next page

~~8308310032~~

OCT 31 1983

DISTRIBUTION LIST FOR BOARD NOTIFICATION

Midland Units 1&2,
Docket Nos. 50-329/330

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OCT 5 1983

MEMORANDUM FOR: D. G. Eisenhut, Director, Division of Licensing, NRR
FROM: R. F. Warnick, Director, Office of Special Cases
SUBJECT: RECOMMENDATION FOR NOTIFICATION OF LICENSING BOARD

In accordance with present NRC procedures regarding Board Notifications, the following information is being provided as constituting new information relevant and material to the Midland OM/OL proceedings. This information deals with the licensee's September 28, 1983, decision to stop all "Q" soil drilling and pile driving imposed as a result of unknowingly drilling into structural concrete. The pertinent facts that relate to the stop work are as follows:

1. On September 20, 1983, the licensee began drilling piezometer BB-1 which is located in the control tower area near the main auxiliary building.
2. On September 22, 1983, concrete was encountered at El. 594.3. Drilling was temporarily stopped until approval was obtained to resume based on existing borings which indicated a six inch concrete working slab at that elevation.
3. On September 23, 1983, concrete was encountered at El. 583.5. Drilling was temporarily stopped until approval was obtained to resume based on existing borings which indicated ten feet of lean backfill concrete at that elevation.
4. On September 26, 1983 steel was encountered at El. 581.3. Drilling was temporarily stopped until approval was obtained to resume based on the assumption that the steel in question was scrap.
5. On September 27, 1983 the steel was cored through, retrieved and found to be one #6 reinforcing bar and one #11 reinforcing bar. Cognizant individuals thought that there was a good possibility that this rebar had been used to reinforce the concrete backfill because of a crane mat used during earlier construction at that approximate location.
6. On September 27, 1983, more steel was encountered at El. 580.1. Drilling was stopped and this time a more thorough review of drawings was made. It became obvious that they had not drilled into fill concrete with added rebar, but into a structural strongback attached to the south side of the auxiliary building H-Line wall.

~~8310260285~~

D. G. Eisenhut

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OCT 5 1983

7. On September 28, 1983, the licensee issued Stop Work Order No. FSW-32 which stopped all "Q" soil drilling and pile driving.
8. On September 29, 1983 the NRC was informed of this stop work. At this time all work remains stopped pending adequate corrective action to preclude drilling into structural concrete. This action includes revising the procedure to include a review of structural drawings and not just buried utility drawings. Also retraining to the new procedure will be accomplished. All completed excavation permits will be reviewed to determine whether structural concrete has been hit in the past and discounted as lean concrete.

If you have any questions or desire further information regarding this matter, please call me.

RF Warnick

R. F. Warnick, Director
Office of Special Cases

cc: A. B. Davis
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