SEB Response: to Stamiris Contention 4.C. b. on SWPS to Judge Harbour's Questions

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

Rowe

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OCT 22, 1982

Docket Nos.: 50-329/330

MEMORANDUM FOR: Elinor G. Adensam, Chief
Licensing Branch #4, DL

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

FROM: Franz P. Schauer, Chief
Structural Engineering Branch
Division of Engineering

SUBJECT: MIDLAND ASLB HEARINGS - STRUCTURAL ENGINEERING INPUT

Plant Name: Midland Plant Unit 1 and 2
Licensing Stage: OL
Responsible Branch: LB No. 4, D. Hood and R. Hernan, LPM
Requested Completion Date: October 22, 1982
Status: Complete

In response to the verbal request of W. Paton and M. Wilcove of OELD, we have enclosed our input to staff testimony in preparation for the upcoming ASLB hearings. The hearings originally scheduled for October 27 through November 4, 1982, that were to cover (1) bearing capacity beneath the Diesel Generator Building, (2) underground piping, (3) Service Water Pump Structure (SWPS) and (4) Permanent Dewatering. We understand these hearings have been rescheduled for November 15-23, 1982, and that the Structural Engineering Branch input is applicable only to the SWPS.

In the enclosure under Part I, we have identified the pertinent SSER sections where the structural engineering staff has addressed the topic scheduled for the upcoming hearings. Under Part II of the enclosure we have identified either the SER or SSER sections or we have provided our response to the safety issues listed in the Stamiris' contention 4.c.b as related to the identified hearing topics.

Any questions that you may have on the enclosed input may be referred to Fra Rinaldi (X24921), Structural Engineering Branch, DOE.

Franz P. Schauer, Chief
Structural Engineering Branch
Division of Engineering

Enclosure:
As stated

cc: See next page

cc w/encl:
R. Vollmer
T. Novak
W. Paton
M. Wilcove
R. Bosnak
[redacted]
D. Hood
R. Hernan
P. Kuo
J. Matra NSWC
F. Rinaldi
E. Adensam

Midland Plant, Units 1 and 2

Docket Numbers: 50-329/330

Structural Engineering Input into Staff Testimony for SWPS

Prepared by: Frank Rinaldi, SEB, NRR

PART I - PERTINENT SSER SECTIONS FOR HEARING ON SWPS

A - SEB SSER SECTIONS

3.7.1.1 Seismic Safety Margins and Damping Values

3.7.2.1 Design Spectra

3.7.2.2 Seismic Safety Margins

3.7.2.3 Soil-Structure Interaction

3.7.2.4 Structure to Structure Interaction (SWPS vs CWIS)

3.8.3 General Introduction

3.8.3.2 SWPS Structural Evaluation

Appendix I Jacking Forces

3.8.3.5 Cracks Evaluation, Monitoring and Repairs

3.8.3.6 Fox-Howlett Splice System

B - NON-SEB SSER SECTIONS RELATED TO SEB ON SWPS

1.7 SER Sections 3.7.1, 3.7.2, 3.8.3 and 3.8.4

2.5.4.4.1 Description of Soil Media (p.23-24)

2.5 Figure 2.9 SWPS Underpinning

2.5.4.5.2 SWPS

2.5.4.6.1.1 SWPS

2.5 Figure 2.12 Instrumentation for Underpinning

2.5 Figure 2.13 SWP Monitoring Instrumentation

2.5.4.6.1 Acceptance Criteria for SWPS

2.5.4.6.3 Long Term Settlement Monitoring

PART II - RESPONSE TO STAMIRIS' CONTENTION 4.C.b ON SWPS

CONTENTION 4.C.b:

4. Consumers Power Company performed and proposed remedial actions regarding soils settlement that are inadequate as presented because:

C. Remedial soil settlement actions are not based on adequate evaluation of dynamic response regarding dewatering effects, differential soil settlement, and seismic effects for these structures:

b. Service Water Intake Building and Its Retaining Walls

SEB STAFF RESPONSE:

Our understanding of contention 4.C.b is as follows:

Consumer Power Company has performed and proposed actions with regard to the SWPS as a result of the soils settlements at the Midland site which are inadequate because these actions have not considered the following:

(1) dynamic response regarding dewatering effects
(2) differential soil settlement
(3) seismic effects

In the design of all Category I structures the applicant is required to consider static and dynamic loads that effect the structure. Each of these loads is increased by an applicable load factor and combined in several load combination equations so to assure consideration of all applicable loads in all possible combinations. The staff has found acceptable loads, load factors and load combinations proposed by the applicant in the evaluation of the SWPS.

As identified in Section 3.7.2 of the SSER the applicant plans to conduct a Seismic Margin Study to evaluate this structure for the seismic site specific response spectra and to compare floor response spectra for the underpinning structure to show that floor response spectra used for the design of these underpinning (1.5xFSAR) envelopes the respective ones developed from the seismic site specific response spectra.

The staff has identified these efforts as confirmatory action items.

The design work performed by the applicant and the confirmatory work to be performed by the applicant and reviewed by the staff prior to plant operation will address the three concerns identified in contention 4.C.b. The staff expects that the confirmatory work will show compliance to NRC acceptance criteria.

The applicant has modeled this structure and the supporting soil media in a conservative manner and has performed and will be performing analysis and

design calculations using criteria acceptable to the engineering community and to the NRC staff. These calculation consider the dynamic response of the structure and soil media to include variation that can be encountered at the Midland site. Specifically, for dewatering the applicant has considered loads resulting from low (elev. 587) and high (elev. 627) water levels. Also, the applicant has and will be considering differential settlement as an additional load in the load combinations used for the design and evaluation of this structure. The effects of differential settlement have been considered for construction conditions and 40-year life design condition. Finally, seismic effects have and will be considered in all engineering analyses applicable to Category I structures and components, other than construction conditions. Therefore, the staff concludes that the applicant has indicated compliance with the three concerns identified in Stamiris' contention 4.C.b.