

Contentions were  
Covered @ Feb 17, 1983 Hearing

1/5/83

ASLB Hearing - Feb. 14-18 @ Midland

Issues to be covered (per meeting of 1/5/83 w/ W. Paton,  
N. Wright, D. Hood and J. Kane) by J. Kane

1. Stamiris Contentions  
4 A. 3) and 5)

4 A. 1 answered on Nov. 16, 1982, Pg. 8797

\* 4 C D - See Nov. 20, 1982 session, pg. 9688

4 C. g, c, d, e, f. w/ respect to concern of differential  
settlement  
see Nov 22 82  
testimony - pg. 9799

2. Warren Contention

✓ No. 1 (See J. Kane testimony, pg. 17 for Feb. 17, 1982 ASLB  
Hearing session, following transcript page 7444 for  
response to Warren Contention No. 1)

3. Seismic shakedown for all structures other than DGB.

See Nov. 15, 1982 Session, pg. 8677 (Dr. Hendron on seismic shakedown)  
\* See Nov. 15, 1982 for J. Kane's statements on seismic shakedown - Pg. 8738

Stamiris Contention 4.A. 2) to be covered by <sup>Darl Hood</sup>  
~~Frank Schaver~~

# Review SSER

## Review Basic Profiles

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1 of  
J. Kane

See 2/17/83 Transcript - J. Kane asked  
if NRC will look @ DGB valve pit settlement - but anything  
occur @ time valve pit was undermined - see L. Landsman NRC

## Response to Stamiris Contentions

### Stamiris Contention 4.A.3 )

"Preloading of the diesel generator building

3) does not allow proper evaluation of compaction procedures  
because of unknown locations of cohesionless soil pockets ; "

Give example - mechanical equipment has many systems - for DGB settlement has been air problem  
Response - The NRC Staff evaluation of the preloading of the DGB has been provided  
in SSER No. 2 (Oct. 1982) (pages 2-24 thru 2-34).

In previous testimony (Nov. 16, 1982, pg. 8799) we have indicated that  
the staff's efforts, with respect to the foundation soils that had been  
surcharged, were directed to determining the engineering properties  
of the soils through explorations and lab testing. Compaction  
procedures are controlled to bring about a condition in the soils  
where acceptable engineering properties have been obtained.

The Staff and its consultant, the COE, have concluded that  
based on the completed subsurface explorations and laboratory  
testing we have reasonably established the static and dynamic  
properties of the foundation soils which were preloaded. These  
properties have been conservatively used in engineering  
analyses (bearing capacity, liquefaction potential, seismic  
induced settlements). The results of these analyses indicate an  
acceptable margin of safety is available.

Also  
pertains  
to  
Stamiris  
Contention  
4.C.e

On page 2-33 of the SSER No. 2, the staff indicates that  
we are in agreement with the settlements established by the  
applicant for the DGB. Both I and the COE have testified  
that we feel it is inappropriate to "best fit" the agreed upon  
settlements with the straight line which the applicant ~~was~~ did  
~~use~~ in its structural analysis of the DGB.

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J. Kane

Stamiris Contention 4.A. 5)

Preloading of the diesel generator building yields effects not scientifically isolated from the effects of a rise in cooling water and therefore not measured properly.

Response - In past testimony the staff has acknowledged their difficulties in evaluating the piezometer data obtained during surcharging. These difficulties result from questions as to whether the full depth of the foundation soils were actually saturated from cooling pond seepage <sup>at the time of surcharging</sup>; our recognition that the piezometers were installed in layered zones of sand and cohesive soils; and the unanticipated behavior in the piezometer performance.

The staff has resolved these difficulties by requiring laboratory testing to establish the engineering properties (e.g. soil shear strength and compressibility characteristics) of the foundation soils which were surcharged.

SRR ? requirements  
effects of diff settlement are unusual

↳ SKP applicable for settlements experienced @ Midland

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3ct

J. Kane

#### Stamiris Contention 4.C.a.

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

a. Auxiliary Building Electrical Penetration Areas & feedwater Isolation Valve Pits "

Response - I am addressing only the "differential soil settlement" aspect of this contention.

An adequate evaluation of differential soil settlement has been made for the remedial measures planned for the Auxiliary Building EPAs and FIVPs.

The remedial measures proposed for the EPAs (permanent underpinning) and FIVPs (excavating, <sup>point</sup>fill and replacing with compacted granular fill and concrete fill) are described on pages 2-16 through to pg 2-23 of the Oct 1982 SSER #2.

For the FIVPs, on pg 2-17 and 2-23, <sup>of SSER No. 2</sup> the staff indicates that the jacking operation beneath the FIVP will cause most of the settlement to occur while the jacks are in place and before final load transfer to the permanent foundation is completed. Any future settlement is anticipated to be ~~very~~ small. ( $< 0.25$  inch - FSAR pg. 2-5-111)

For the EPAs, on pgs. 2-23 and 2-40 the staff has indicated that differential settlements are anticipated to be <sup>small</sup> (less than <sub>cover</sub>)



0.25 inch) after final load transfer has been made to the permanent wall and that the underpinning for the EPA will provide a stable and safe foundation (pg 2-23)

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J. Kane

Stamiris Contention 4.C.C.

See FSAR pgs. 2.5-118 & 2.5-130

C. Borated Water Storage Tanks

Response The staff has presented its evaluation of the surcharging fix performed for the BWSTs in SSER No. 2, pgs 2-34 and 2-35.

In addition, I did submit testimony in response to Stamiris Contention 4.C.C at the February 17, 1982 hearing session. (See pgs 16-18 of my testimony which follows Transcript pg 7444.) The conclusion in my previous testimony indicates that differential settlements will be small following the surcharging of the valve pits and ring foundations and will be within acceptable limits that have been safely designed for with the proposed new integral ring beam.

2/8/83

by  
J. Kune

## Stamiris Contention 4.C.d

d. Diesel Fuel Oil Storage Tanks (See FSAR Fig. 2.5-191 )  
FSAR Fig. 2.5-120

My Previous testimony (page 12) contained in the February 18, 1982 transcript record (follows page 7752) provided the staff input with respect to the foundation stability and settlement of the Diesel Fuel Oil Storage Tanks.

The concrete pad foundations of the Diesel Fuel Oil Storage Tanks rest on predominantly medium to stiff sandy clay fill. The tanks were surcharged by filling the tanks in 1979. Following filling, the tanks experienced a maximum settlement of 0.25 inch. There was little change in the settlement history after 1979 until temporary construction dewatering operations were initiated in late 1980. Under <sup>temporary</sup> dewatering conditions, the maximum total observed settlement on the tanks reached approximately 0.5 inch but a rebound of approximately 0.10 <sup>inch</sup> did occur when the groundwater was permitted to rise prior to running the full scale field drawdown test. During years of plant operation an additional settlement of approximately 0.50 inch has been estimated.

Dr. Woods in his recent testimony has estimated a maximum settlement of 0.10 inch could occur under seismic loading.

The Staff has concluded that the settlements measured to date for the Diesel Fuel Oil Storage Tanks have not been large and that <sup>these settlements along with</sup> future estimates of settlement are reasonable <sup>values</sup> and acceptable to the Staff for use in design.



## Stamiris Contention 4, c. e

### e. Diesel Generator Building

At the December <sup>6-10</sup> 1982 hearing sessions, a great deal of testimony was presented on the DGB and included discussions ~~of~~ differential settlement.

The applicant completed an analysis which used a "best fit" straight line approach for the actual measured and predicted settlement values

The NRC <sup>staff</sup> has stated in these hearings that the actual measured settlement values are the BEST characterization of the settlement at the site

The Structural Engineering group at NRC has accepted the DGB based on an independent approach - that of the crack analysis and <sup>reliance on</sup> surveillance program

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J Kane

## Stamiris Contention 4. C. f

f. Related Underlying Piping & Conduits { See FSAR pg. 2.5-120  
May 3, 1982 submitted by CPC-Encl. 3  
SSER Section - Pg. 2.75

At the February 1982 hearing sessions, I did present testimony (in <sup>testimony</sup> response to Q8, pg. 6) that indicated the Staff's agreement with the applicant's estimate of 3 inch maximum <sup>future</sup> settlement. We feel this settlement is a conservative upper bound limit which could be expected during years of plant operation.

This estimate is based on extrapolation of data from nine berros anchors in the plant fill at comparable depths (7' + 12') where underground piping and conduits have normally been installed.

The time period for the 3-inch estimated settlement is from Sept. 1981 to the year 2025 and includes secondary consolidation (2" max), settlement due to dewatering ( $\frac{1}{2}$ -inch) and seismic shakedown ( $\frac{1}{2}$ -inch).

The geotechnical engineering staff has concluded that differential settlements values identified for use in analysis of underground piping are conservative and acceptable to the staff.

(over)

## Warren Contentions No 1

- Read contention
- I did <sup>previously</sup> respond to Warren Contention No. 1 by providing testimony at the Feb. 17, 1982 hearing session. My testimony on this issue is found on page 17 ~~and 18~~ following transcript page 7444 and indicates the staff is not in agreement with Mrs. Warren Characterization of the plant fill (Read pg. 17 testimony @ top)

The staff has concluded that pre-loading in the DGB area and BWST area did improve the denseness and engineering properties of the plant fill soils

The effects of preloading (<sup>stresses & strains</sup> caused by settlements) have been evaluated and reported in SSER No. 2 and have been discussed at great length at previous hearing sessions (On BWST, on DGB, on underground piping)