

CONDENSED TRANSCRIPT

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

OFFICE OF THE SECRETARY
RULEMAKINGS AND
ADJUDICATIONS STAFF

Before the Atomic Safety and Licensing Board

In the Matter of) Docket No. 72-22
) ASLPB No. 97-732-02-ISFSI
PRIVATE FUEL STORAGE)
L.L.C.) DEPOSITION OF:
)
(Private Fuel Storage) <u>DR. WEN-SHOU TSENG</u>
Facility))
)
) (Utah Contention L/QQ)

Tuesday, March 12, 2002 - 9:55 a.m.

Location: Utah Attorney General's Office
160 East 300 South
Salt Lake City, Utah

Reporter: Vicky McDaniel
Notary Public in and for the State of Utah

State's
Exhibit 113



50 South Main, Suite 920
Salt Lake City, Utah 84144

CLEAR REGULATORY COMMISSION

Docket No. _____ Official Exh. No. 113
In the matter of _____
Staff _____ IDENTIFIED
Applicant _____ RECEIVED
Intervenor REJECTED _____
Other _____ WITHDRAWN _____
DATE 5-8-02 Witness _____
Clerk pmf

In the Matter of Private Fuel Storage
Dr. Wen-Shou Tseng * March 12, 2002

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1 calculation, and he indicated that the differential is
2 the order of .001 second. And at .001 second one would
3 consider, you know, for that small pad the effect would
4 be very, very high frequencies, something on the order
5 greater than 50 Hz, which is beyond the frequency range
6 of our interest, actually. So I would expect this
7 effect would be insignificant.

8 Q. What about for a quadrant of pads in soil
9 cement that would act as one integrated pad?

10 A. Would you say that again?

11 Q. What about for a quadrant of pads, which I
12 believe is 125 pads, and the soil cement in between
13 that act as an integrated structure?

14 MR. GAUKLER: Objection, lack of foundation.
15 Answer if you can.

16 A. Well, even though you have soil cement in
17 between the pad, but there is no structure continuing
18 through -- in other words, there is no rebar going
19 through it. So even though it may appear to be
20 integrated, that -- structurally they are still
21 separate. So I wouldn't consider that to be a credible
22 case of integrating all the pads together.

23 Q. So do you believe the pads will act
24 independently of each other, out of phase in their
25 motions?

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1 A. Well, each pad of course is by itself a
2 structural element. It may have some minor interaction
3 between pad to pad through the underlying soil, but
4 again, that I believe will be a quite secondary effect.

5 Now, if you consider all the pads lying in
6 one big quadrant, from one end to the other there may
7 be bigger variation, but since each pad is structurally
8 not connected, there is no effect from one to the
9 other, especially from one extreme end to the other
10 extreme end. And they separate so far apart and they
11 won't impact much, either. Only when the pad, they are
12 structurally integrated together in such a large
13 dimension that such time differential would have bigger
14 effect.

15 Q. So do you believe the soil cement will not
16 have an impact in integrating the motion of the
17 different pads together?

18 A. It stiffens up the soil, certainly, and that
19 effect has been included in this. But structurally you
20 don't have really positive connections. Eventually I
21 don't think they would behave as an integrated
22 structure.

23 Q. Did you evaluate the adverse effect of
24 inclined waves on the seismic response of the pads?

25 A. Would you say that again?

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1 Q. Did you evaluate any adverse effect of
2 inclined -- strike that. Did you evaluate any adverse
3 effects of inclined waves on the seismic response of
4 the pads?

5 A. We -- in our calculation for pad design we
6 did not explicitly consider that. But this incline is
7 a small angle, which Bob Youngs had estimated to be the
8 case, X minus like 11 degree from vertical, which is
9 very small. The effect of that will be very small, as
10 I stated earlier.

11 And in addition, you know, if you look at
12 the ASCE's 4-86, some of this variation of soil
13 property from best estimate to lower bound to upper
14 bound with a large factor, a factor of two in modulus,
15 is partially to cover some of these uncertainties, I
16 would call, nonvertical propagating wave, some slide
17 possibility differentials, and many other uncertainties
18 which cannot be quantified.

19 So that variation of soil property from
20 lower to upper bound in the right range is partially
21 intended to cover some of this effect.

22 Q. Do you anticipate conducting any additional
23 analyses or calculations on the PFS project?

24 A. As far as pad design and analysis is
25 concerned, I do not foresee other than if we need to

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1 answer certain questions, we may do a few calculations
2 to back up our response.

3 MS. NAKAHARA: If you'll excuse us for one
4 moment.

5 We have -- I have no more questions. Thank
6 you.

7 MR. GAUKLER: I may have a few questions.
8 We'll take a break.

9 (Recess from 1:58 to 2:00 p.m.)

10 EXAMINATION

11 BY MR. GAUKLER:

12 Q. I have a couple quick questions.

13 At one point in time in the questions asked
14 by Ms. Nakahara you were talking about Table D-1(d) on
15 sheet 234 of your calculation. Correct?

16 A. Yes.

17 Q. And that sheet shows vertical displacements?

18 A. (Witness nods head.)

19 Q. Are those vertical displacements all at one
20 time, or what are the vertical displacements displayed
21 in that table?

22 A. The vertical displacement displayed in this
23 table for various nodal points are maximum for the
24 individual nodes. They may or may not be at the same
25 time. So the number in each of these loads would show

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