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

PDR

November 8, 1979

Mr. Robert Murray
Lawrence Livermore Laboratory (L-90)
P. O. Box 808
Livermore, CA 94550

Dear Bob:

We recently met with Professor William Hall and Dr. John Stevenson to discuss the seismic review of Palisades Unit No. 1 and Oyster Creek Unit No. 1. We agreed that the methodology and parameters discussed in the enclosed summary should be treated as an interim guide for you to use in your efforts to review the above facilities.

If you and your consultants feel that some other alternative approaches are more appropriate than the approaches outlined in the enclosed summary, please submit to us detailed theoretical and technical data to substantiate your approach.

Sincerely,

Charles H. Hofmayer, Section Leader
Engineering Section
Systematic Evaluation Program Branch
Division of Operating Reactors

Contact:
Henry Lee
492-7807

Enclosure:
As stated

cc:
D. Crutchfield
P. Kuo
H. Levin
T. Cheng
H. Lee
W. Hall, Univ. of IL
N. Newmark, Univ. of IL
J. Stevenson, Woodward-Clyde
R. Kennedy, EDAC
D. Wesley, EDAC
M. Ma, EG&G
T. Wambach
J. Wetmore

1550 021

7912130 008

P

SUMMARY OF METHODOLOGY AND PARAMETERS TO BE USED
IN SEP SEISMIC REVIEWS FOR PALISADES AND OYSTER CREEK
NUCLEAR POWER PLANTS

I Palisades

A. Soil Properties -

1. Shear modulus (or shear wave velocity): The equiv. shear modulus "G" of the foundation soil strata at the strain level corresponding to a 0.2g peak ground acceleration should be used. Parametric studies need to be performed by varying this property ± 50%.

2. Poisson's ratio: At this site with high water table (at ground surface), Poisson's ratio 0.45 will be used for saturated sand.

B. Soil Springs - Since this site has shallow soil overburden (only ± 100' to bedrock), Luco's approach for a rigid surface foundation on a layered media should be used instead of using the procedures developed by Kausel. Kausel's approach may not be appropriate because it cannot take the flexibility of the bedrock into account. The containment structure is only embedded partially on one side. Thus, embedment effects can be ignored.

C. Soil Damping - The following values may be used for soil damping (material damping plus geometric damping):

	% of Critical Damping
Rocking	10
Swaying	15
Vertical	20

As suggested by Professor Hall, some sensitivity studies about these values should be performed.

D. Composite modal damping - using the median values of the structural damping ratio recommended in the NUREG/CR 0098, the composite modal damping may be obtained by either of Biggs, Roesset or Tsai's method.* Care and judgment must be exercised when the composite modal damping exceeds the structural damping by a very large amount. Dr. Stevenson noted that the NRC has not accepted and licensed a nuclear power plant with composite damping higher than 12% of the critical.

E. Structural Analysis Method - Modal analysis by the Response Spectrum Method.

1550 022

*Sensitivity studies using the lower bound values (the values as suggested in R. G. 1.61) of the structural damping ratio should be performed to assess the impact of deviations from current criteria.

II. Oyster Creek

A. Soil Properties

1. Shear modulus: The weighted average shear modulus should be used ($G_{2\%} = \pm$ 1500 KSF corresponding to the strain level of 5×10^{-2}%).

2. Poisson's ratio: Since the water table is high, ν = 0.35 - 0.4 is recommended.

B. Soil Springs - Derived from the elastic half space theory. Embedment effects may be considered by using the approach developed by Kausel or Novak.

C. Soil Damping - The following values may be used for soil damping (material damping plus geometric damping):

	% of Critical Damping
Rocking	15
Swaying	20
Vertical	25

D. Composite Damping - Same as Palisades

E. Structural Analysis Method - Same as Palisades