

Natural Resources Defense Council, Inc.

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PROD. & USEL. SEC. 50-275-323 04
February 2, 1979

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Howard K. Shapar, Executive Legal Director
Lee V. Gossick, Executive Director for
Operations
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

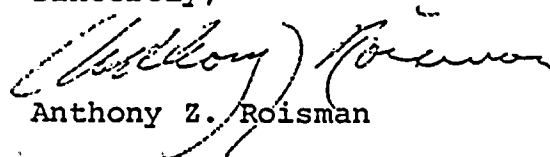


Dear Messrs. Shapar and Gossick:

It has recently been drawn to my attention that my concern about the disclosure by the Staff of consultants' reports which suggest unsafe conditions at nuclear facilities should not be limited merely to the question of containment buckling criteria. By letter dated September 19, 1978, the Staff counsel in the Pacific Gas & Electric Company (Diablo Canyon) operating license proceeding advised the Board and parties of the existence of a consultant's memorandum dealing with the problem of asymmetric loads during blowdown following a loss of coolant accident, which had been in the hands of the Staff since November 4, 1977. Once again it appears that the Staff, for reasons unknown to the public, chose to hold in its hands a report, the implications of which were clearly relevant to the licensing of a number of nuclear power plants.

I therefore once again reiterate my request to you to come forward with a written explanation for the Staff policy with respect to this issue. I am aware that Mr. Matson has attempted to reach me by phone on this subject and regret that my schedule has not made it possible for me to return his call. Nonetheless, I want to stress that I cannot consider an oral response a satisfactory substitute for a written statement.

Sincerely,


Anthony Z. Roisman

enclosure
cc (with enclosure):
Chairman Hendrie
Commissioner Gilinsky
Commissioner Ahearne
Commissioner Bradford
Commissioner Kennedy



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

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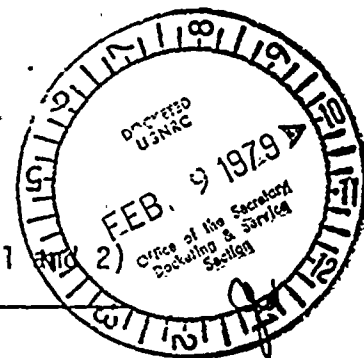
September 19, 1978

Elizabeth S. Bowers, Esq., Chairman
Atomic Safety and Licensing Board Panel
U.S. Nuclear Regulatory Commission
Washington, D. C. 20555

Mr. Glenn O. Bright
Atomic Safety and Licensing Board
Panel
U.S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dr. William E. Martin
Senior Ecologist
Battelle Memorial Institute
Columbus, Ohio 43201

In the Matter of
Pacific Gas and Electric Company
(Diablo Canyon Nuclear Power Plant, Units Nos. 1
Docket Nos. 50-275 O.L. and 50-323 O.L.)



Dear Members of the Board:

The results of analyses performed for the NRC Staff by a consultant indicate that the impact force on fuel assembly spacer grids, caused by asymmetric loads during blowdown following a loss-of-coolant accident, may be more sensitive to core plate motion than it was originally believed to be. A copy of the consultant's memorandum on this subject dated November 4, 1977, is enclosed. As noted, the information is preliminary. Therefore, the Staff's conclusion that pressurized water reactor fuel assembly designs are acceptable has not been altered. However, a question has been raised about the margin to deformation of the fuel assembly grids.

The NRC Staff and its consultant are continuing their evaluation of fuel assembly mechanical response.

Sincerely,

Richard J. Goddard
Counsel for NRC Staff

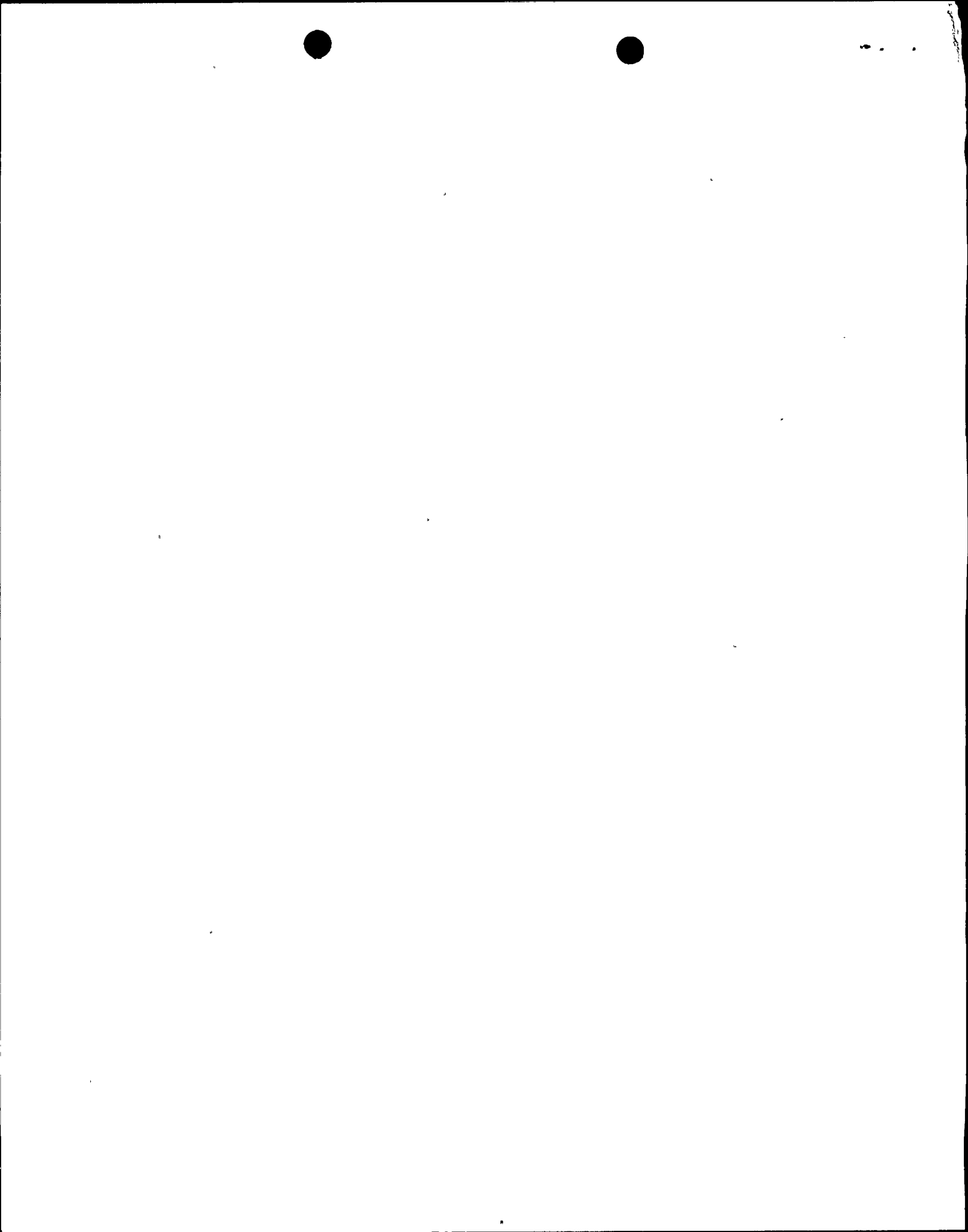
Enclosure

cc (see page 2)

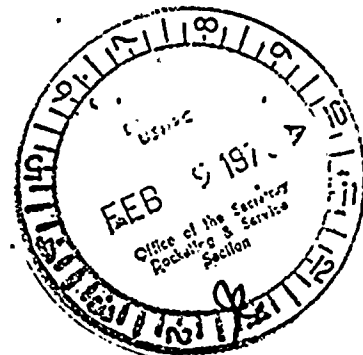


cc (w/ encl.):

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Atomic Safety and Licensing Appeal Panel
Docketing and Service Section



NOV - 4 1977



R. E. Tiller, Director
Reactor Operations & Programs Division
Idaho Operations Office - DOE
Idaho Falls, Idaho 83401

PWR FUEL ASSEMBLY MECHANICAL RESPONSE ANALYSIS - Stig-316-77

- Ref:
- (a) R. L. Grubb, PWR Fuel Assembly Mechanical Response Analysis, Idaho National Engineering Laboratory, RE-E-77-141, March 1977
 - (b) R. L. Grubb, PWR Fuel Assembly Mechanical Response Analysis, Amendment No. 1, Idaho National Engineering Laboratory, RE-E-77-140, March, 1977
 - (c) R. L. Grubb and B. F. Saffell, Jr, Non-Linear Lateral Mechanical Response of Pressurized Water Reactor Fuel Assemblies, ASME Paper 77-WA/DE-18, December 1977
 - (d) H. Hino, H. Mizuta, and H. Tsumura, Development of Advanced Method For Fuel Seismic Analysis, 4th International Conference on Structural Mechanics in Reactor Technology, San Francisco, California, USA, August, 1977
 - (e) R. L. Grubb, Feasibility Study for Bounding the Lateral PWR Fuel Assembly Mechanical Response Analysis, Idaho National Engineering Laboratory, RE-E-77-160, Rev. 1, July, 1977

Dear Mr. Tiller:

A parametric study to assess the effect of variations in core plate motions on fuel assembly spacer grid crushing loads is currently in progress. A summary description of this study including preliminary results has been prepared at the request of the Nuclear Regulatory Commission's Division of System Safety, Core Performance Branch. Results of this study indicate that a small variation in core plate frequency may have a significant effect on spacer grid crushing loads. As the study is not complete, these results should be considered preliminary.

A mechanism was postulated in Reference (e) which indicated that the input core plate motion could significantly affect spacer grid crushing loads. The primary objective of the present study was to determine if this mechanism could be shown to exist. A secondary objective is to compare linear and nonlinear analysis techniques. In summary then the purpose of this study is twofold:

- (1) Statistically determine the effect of core plate frequency and magnitude on the fuel assembly maximum spacer grid crushing loads, and
- (2) Statistically compare linear and nonlinear analysis methods for lateral fuel assembly mechanical response in an attempt to simplify the nonlinear analysis.



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 Nov. -4 1977
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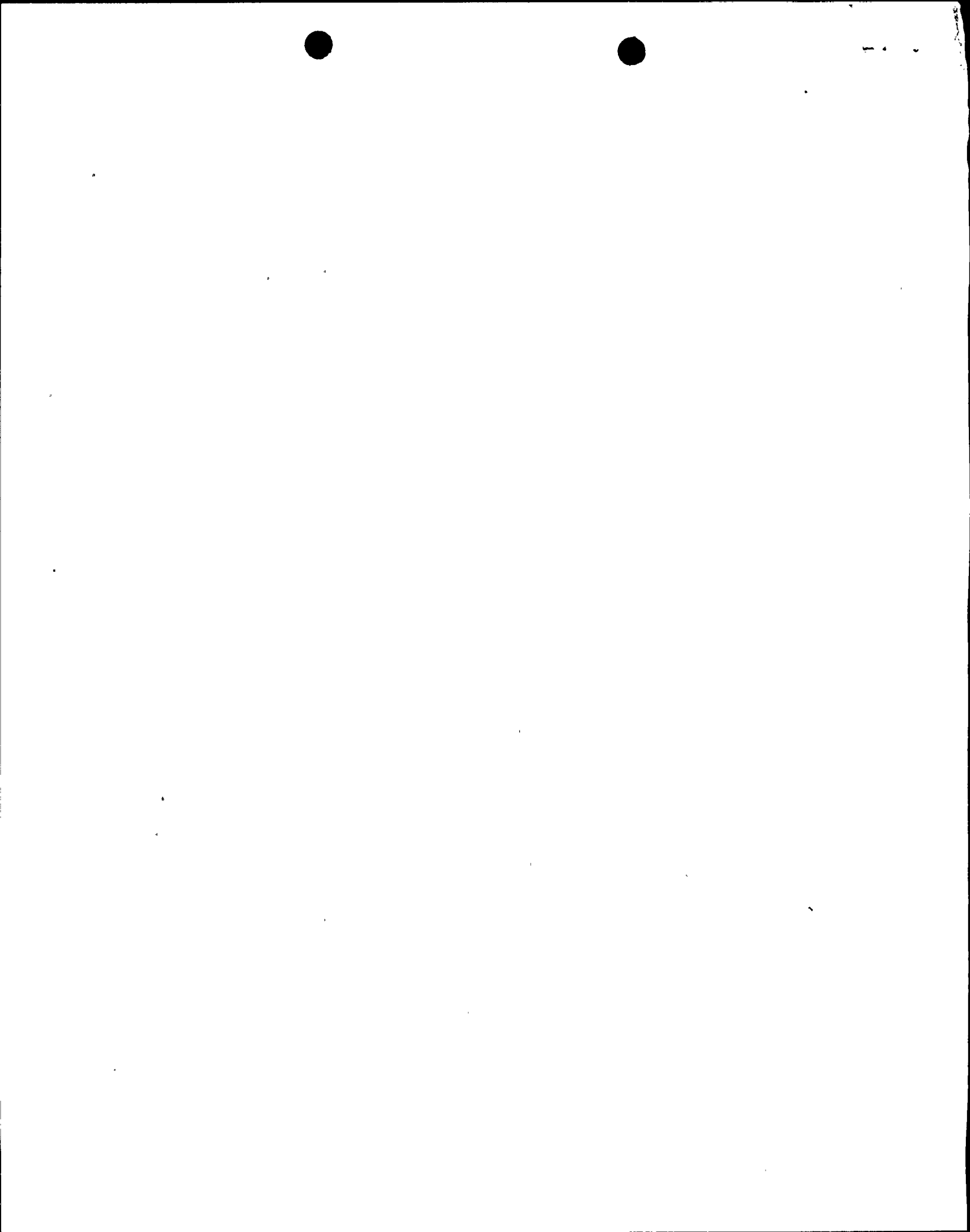
The structural model utilized to analyze the fuel assembly mechanical response is basically described in References (a) through (c). Two exceptions included in the present study are the use of fuel assembly experimental frequencies and mode shapes and utilization of the method presented in Reference (d) for calculation of spacer grid crushing loads. The nominal forcing function, core plate accelerations, are presented in Reference (b). While eight variations on the frequency and amplitude of core plate motions are to be considered, only the four extreme cases are addressed in this discussion. The four cases are $\pm 10\%$ variation on frequency and $\pm 10\%$ variation of the amplitude. It is noted that all the frequencies contained in the core plate motions are varied the same amount. Nonlinear dynamic analysis as described in References (a) through (d) is in progress and preliminary results are provided in Table 1. A linear analysis is also being pursued using the methods outlined in Reference (e).

TABLE 1
 RATIO OF PEAK SPACER GRID CRUSHING LOAD TO THE
 NOMINAL CURSHING LOAD¹

Spacer Grid Elevation	Maximum Crushing Load/Nominal Crushing Load ¹			
	-10% Frequency	+10% Frequency	-10% Amplitude	+10% Amplitude
Center	1.76	0.804	0.979	1.04
Center-up	1.45	0.844	0.842	1.23
Center-down	2.11	0.830	0.835	1.25
Top	1.34	0.945	0.771	1.34
Bottom	1.56	0.806	0.863	1.26

¹Nominal crushing load is the peak spacer grid crushing load obtained from the base case core plate motions.

Based on the results in Table 1, it does appear that a variation in frequency of ten percent effects a significant change in the spacer grid crushing loads. This indicates that a variation in this parameter may be in order for this type of nonlinear analysis. It should be pointed out that the model studied represents a general configuration. The purpose of this study was not a direct analysis of a specific plant but to determine if the mechanism postulated:



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Reference (e) could actually be elicited in the nonlinear analysis. The mechanism appears to exist; thereby causing concern that permanent deformation of spacer grids may occur.

Upon completion of this study the conclusions presented in Reference (b) will be reassessed.

Very truly yours,

ORIGINAL SIGNED BY

R. R. Stiger, Manager
Reactor Behavior Division

BFS:clj

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