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U.S. NUCLEAR REG. COMM.  
ADVISORY COMMITTEE ON  
REACTOR SAFEGUARDS

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Mr. E. Igne  
Advisory Committee on Reactor Safeguards  
Nuclear Regulatory Commission  
Washington, D.C. 20555

Re: GETR

Dear El:

I have examined all of the reports and answers of requests for additional information that you arranged to have sent to me following the meeting which we attended near San Francisco last November. These are essentially limited to the structural design and redesign of GETR. I have found very little to question or criticize in all this material and it seems to me that GE's staff and consultants have done a good job.

Here are my questions:

EDAC 117 217.10 Pool Heat Exchanger HE 102. The auxiliary seismic support is being designed to resist 1.0 g with a safety factor 4. However, the maximum floor acceleration at that level is predicted to be about 1.3 g while the spectral acceleration there is 8.75 g (1 % damping) and 5.5 g (3 % damping) over a considerable range of frequencies. Moreover, the support consists of a pair of cables wrapped around the unit which can give support only when in tension.

EDAC 117 217.08 Fuel Flooding System. The dynamic response of the 50,000-gal water containers was made by means of Housner's method. The latter is intended for rigid tanks with open tops which are very different from flexible fabric bags which under consideration here. It may well be that the predictions are conservative, or are conservative in most but not all respects. For example, is the equivalent water height of 8'3" for determining the earthquake loading on the end retaining walls (which have only 10 % margin of safety - pp 2-2,2-3) conservative? In addition, I do not understand the shape of the water bearing pressure diagram (Load Case 1) in Fig. 2-2. Should it not be a triangle?

Structural Mechanics Associates GETR 78-1. Fuel Storage Tanks.

On page 23 and in Appendix B: What is justification of applying 2/3 of kinetic energy and inertia force as a loading on the outer container? I note that the same question was previously raised by the NRC Staff; the answer was hardly convincing.

Page 25 and Appendix A3-1 to 5: Analysis of rock bolts: For  $p_o = 3$  ksi (maximum concrete bearing stress) the bolt force is calculated to be  $P_B = 30$  k while the allowable value is 35 k. However,  $p_o = 3$  ksi is very low for massive concrete which is sure to be stronger than test cylinders of the same material. Moreover I do not check the numbers given. I find for  $p_o = 3$  ksi at node 1,  $b_o = 4.9$ ", giving  $P_B = 34$  instead of 30. Using a more realistic  $p_o = 6$  ksi gives  $b_o = 3.4$ " and  $P_B = 33$  k

GETR  
M. P. WHITE

25 July 1978 Responses to NRC questions on Phase 2 Report: Page 6, 2d full paragraph: It seems to me that the small difference between results of the 3-dimension elastic mathematical model and the 2-dimensional non-linear model with linear elastic analysis more likely coincidence than proof of the negligible influence of the containment shell. The light weight of the shell is enough reason for its unimportance.

Undated Response to NRC request for additional information: Response to Question 11 regarding fuel storage racks: (Also GE Report DSAR 78-4, June 1978) What is the basis for the friction coefficient (0.349) used here? Reference to a memo quoting Dr. Rabinowicz is not enough. Can a copy of Dr. R's report be supplied? (Ref. GE VPF V5455, 1-3-78)

Response 12 of above: Questioned was the conservatism of the rack sliding calculations. The response stated that the assumed input was conservative and this is not an adequate response. For the following reasons I question the validity of the response calculation briefly discussed in DSAR 78-4 (ref. above):

1. The equations of motion given are incorrect since  $u$  must be identically zero part of the time (when there is no relative motion).
2.  $m'u_g$  is the driving mechanism. The very small value of  $m'$  (=  $M'$  in Table 2?) means that the input is weak. It is not obvious why  $m'$  is so small.
3. The extremely small predicted rack displacement - 0.16" - is hard to accept when one remembers that much weaker base motions have moved transformers and other objects by amounts of several inches.

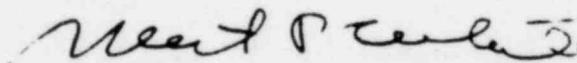
Besides the items referred to above I have examined the following:

EDAC Reports 117 217 02, 03, 05, 06, 07, 09 and an unnumbered Attachment 1, dated 16 December 1977.

Structural Mechanics Associates GETR 78-1 Third Floor Missile Impact System.

GE Responses to NRC with dates as follows: Nov. 11, 1977, Attachment 1 of Feb. 24, 1978, June 1978, July 9, 1979, Sept. 5, 1979 and Sept. 21, 1979.

With best regards,



Merit P. White