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Peter A. Morris, Director
Division of Reactor Licensing

LIMERICK GENERATING STATION UNITS NO. 1 AND 2
DOCKET NOS. 50-352 AND 50-353

Adequate responses to the enclosed list of questions, prepared by the DRS Mechanical Engineering Branch, will be required before we can complete our review of the subject application. These questions concern the material presented in Sections 2 and Appendix A and B of PSAR covering seismic input design criteria for structures, systems, and components.

The DRS seismic consultant, Newmark and Hall, have not completed their initial review. Their requests for additional information will be submitted in a separate transmittal.

Original signed by
E. G. Case

Edson G. Case, Director
Division of Reactor Standards

Enclosure:
List of Questions

cc w/encl:
R. Boyd, DRL
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Distribution:
Suppl. Docket File 50-352 & 353
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DATE ▶	6-30-70	6-30-70	7-1-70	7-8-70		

Form AEC-318 (Rev. 9-53) U.S. GOVERNMENT PRINTING OFFICE: 1969 — O-364-598

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ADDITIONAL INFORMATION REQUEST

LIMERICK GENERATING STATION UNITS NO. 1 AND 2

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A. Structures, Systems, and Components

1. The proposed TID seismic design spectra produce a peak amplification factor of approximately 2.2 for 2% damping. Historic seismic records have resulted in amplification factors in the range of 2.5 to 4.5. Provide seismic design spectra for the site which include more appropriate amplification factors, and include the effects on the predominant period range which define acceptable seismic design spectra considering distance between the seismic disturbance and the site.

2. Specify the criteria which will be used in the determination of the time history(ies) associated with the seismic design spectra of the site, and describe the time histories utilized and the enveloping technique employed.

3. Provide the bases for the selection of and conservatism in damping factors, and relate these factors to the associated construction code allowable design stress limits which will be used in designing structures, systems, and components for the Design Bases Earthquake (DBE).

4. Equipment spectra response curves for various locations within the building structures are not directly obtainable from the proposed modal response multi-mass seismic system method of analysis. Provide

the basis for and the conservatism in the use of this method, either by demonstrating equivalency to a multi-mass time history method or by submitting other theoretical or experimental justification.

5. The proposed static seismic design analysis for Class I seismic structures mainly or entirely below site grade may not always be sufficiently conservative. Justify the use of this method by demonstrating equivalency to a multi-mass dynamic method of design analysis.

6. The use of the static loads equivalent to the peak of the floor spectrum curve in the seismic design of piping may not alwasys be sufficiently conservative. Provide justification that the use of this peak of the spectrum curve includes the contribution of all significant piping dynamic modes of response under seismic excitation.

7. The classification of all piping having frequencies greater thamb 20 hz under seismic excitation, as appropriate for design as rigid systems, may not provide sufficient conservatism in some cases. Provide the basis for the selection of 20 hz value by demonstrating that the earthquakes specified for the site and building response characteristics either filter or preclude higher frequencies.

8. List all Seismic Class I structures, systems, and components and the associated method of seismic analysis or empirical (tests) methods applied in the design of the respective structures, systems, and components, including applicable design stress and strain criteria which will be used.

B. Reactor Vessel Internals

1. With respect to the reactor vessel internals, a static design analysis is proposed which may not be sufficiently conservative. Justify the use of this method by demonstrating equivalency to a multi-mass dynamic method of design analyses or other experimental data which considers the following individual dynamic responses:

   a. Seismic loadings of the Design Basis Earthquake (equivalency to 1g static load),

   b. Blowdown hydrodynamic forces under postulated loss-of-coolant accident conditions,

   c. Loading combination of the Design Basis Earthquake and loss-of-coolant accident conditions,

   d. Vibratory excitations induced under normal reactor operating conditions.