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AUG 21 1981

MEMORANDUM FOR: Donald Sells, Project Manager
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THRU: David Jeng, Section A Leader
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FROM: Syed K. Shaukat
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SUBJECT: SEB POSITION ON RESOLUTION OF SOUTH TEXAS SSI ISSUE

In the meeting of August 7, 1981 on SSI of South Texas Project, after having explained the technical basis for the SEB SSI related position and discussion with the applicant on South Texas SSI issues, the SEB staff suggested that among various options available to the applicant for the resolution of the SSI issue, the use of the following approach to meet the intent of the SEB SSI position would be acceptable:

Use Elastic Half Space Method of Analysis without reducing the input motion due to embedment of structure in soil. Apply the Regulatory Guide 1.60 motion properly anchored at the OBE/SSE "g" values in the free field at the foundation level and compare the resulting response spectra with those of Finite Element Method. The applicant should demonstrate that at least the intent of the following position is fully met:

> Methods for implementing the soil structure interaction analysis should include both the half space and finite element approaches. Category I structures, systems and components should be designed to responses obtained by any one of the following methods:
>
> (a) Envelop the results of both EHS and FEM;
>
> (b) Results of one method with conservative design considerations of effects from use of the other method; and
>
> (c) Combination of (a) and (b) with provisions of adequate conservatism in design.

Tne above mentioned comparison of floor response spectra needs to be done only for key structures at key levels e.g., 6 key levels of reactor containment building, 4 key levels of auxiliar building etc.

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The SEB staff mentioned that if the actural design floor response spectra are compared with those obtained by enveloping the spectra resulting from the FEM and EHS methods of analysis, there may not be any appreciable change in the design of structural elements, because HL & P and Brown & Root have mentioned that enough conservatism is already built in the design by using Finite Element Method. However, there may be cases where the components and equipments may not meet the seismic criteria based upon the enveloped response spectra. HL & P may need to look into these cases and study the specific impact of NRC's current position on the cases in order to qualify them for the seismic criteria.

If the floor response spectra obtained by enveloping are higher than those used for actual design, HL & P still has a choice to justify that the additional stresses resulting from the enveloped spectra are acceptable and overall design adequacy is maintained by considering the actual as-built-strength of the structure. For concrete structures, the as-built-strength will be the average of the compressive strength, established by tests. For both reinforcing and structural steel, the as-built yield strength will be the average of the actual tested yield strength, but in no case shall it be greater than 70% of the ultimate strength. The scope and the extent of test program and resulting test data shall be submitted for review and approval by the staff.

Other approaches for demonstrating the seismic design adequacy of Category I structures and systems which meet the intent of this position are also acceptable if reviewed and accepted by the staff. For example if enough seismic data for the South Texas site and other sites having similar regional and local seismicity characteristics are available, then the site specific spectra approach may be a viable option to be considered.

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