



UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, D. C. 20555

TAB 6.1

December 3, 1982

MEMORANDUM FOR: ACRS Members

FROM: *for* R. Savio, Senior Staff Engineer

SUBJECT: DISCUSSION ON SEISMIC DESIGN METHODOLOGY

As per the Full Committee's request at the November 11-12, 1982 meeting, a briefing has been arranged on selected seismic design topics. This is being done in support of the Committee's consideration of the draft letter on seismic design margins which was presented at the November 11-12, 1982 meeting by Dr. Okrent and Dr. Siess. The agenda for this discussion and a copy of the draft letter is enclosed as Attachment A.

In the context of these discussions, I would note that the USGS has recently issued a November 18, 1982 letter updating their position on the Charleston earthquake of 1886. The letter specifically states the following:

"Because the geologic and tectonic features of the Charleston region are similar to those in other regions of the eastern seaboard, we conclude that although there is no recent or historical evidence that other regions have experienced strong earthquakes, the historical record is not, of itself, sufficient grounds for ruling out the occurrence in these other regions of strong seismic ground motions similar to those experienced near Charleston in 1886. Although the probability of strong ground motion due to an earthquake in any given year at a particular location in the eastern seaboard may be very low, deterministic and probabilistic evaluations of the seismic hazard should be made for individual sites in the eastern seaboard to establish the seismic engineering parameters for critical facilities."

The NRC in the past has taken a licensing position that any reoccurrence of this earthquake be confined to the Charleston area. The Charleston earthquake has been assigned an intensity of MMI X. The SSE for plants in this region is typically associated with the occurrence of a MMI VII or MMI VIII earthquake. I have included a figure showing some of the various MMI peak ground acceleration relations which have been used in the past to give you some perspective as to the effect on ground acceleration as Attachment B. The Trifunac Brady relation has been used to a large extent by the NRC Staff in the past. I have marked the curve with a heavy black line.

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I have included the new USGS letter and the NRC Staff preliminary plan for responding as Attachment C. In summary, the staff is proposing a probabilistic treatment of Eastern US seismicity (with industry sponsored probabilistic estimates of the seismic hazard for all plants on the eastern seaboard) and the integration of the results into a Systematic Evaluation Program type engineering evaluation of the seismic design of the affected plants. This could well lead to an evaluation of a plant's vulnerability to a earthquake more severe than what was used for the SSE.

The USGS letter was the subject of a combined USGS-NRC-Industry meeting on November 30 - December 1, 1982. I will provide a report on this meeting before the scheduled Friday, December 10, 1982 discussion.

Enclosures: As stated

cc: ACRS Technical Staff