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NOV 30 1978

Docket Nos. 50-327/328
50-390/391
50-438/439

Mr. N. B. Hughes
Manager of Power
Tennessee Valley Authority
830 Power Bldg.
Chattanooga, Tennessee 37401

Dear Mr. Hughes

Subject: Clarification of Seismic Issues on Sequoyah, Watts Bar, and Bellefonte

At the November 9, 1978 meeting between TVA and the staff, issues concerning the staff's request for additional information relating to the TVA study "Justification of the Seismic Design Criteria Used for the Sequoyah, Watts Bar and Bellefonte Nuclear Power Plants Phase II" were discussed. Clarification was reached on certain issues and TVA requested the staff's position on others. Attached is a restatement of our views on those issues clarified and our position on those issues upon which clarification was requested.

This information is identical to that transmitted to your staff by telecopy on November 22, 1978.

Sincerely,

Original signed by:
Roger S. Boyd

Roger S. Boyd, Director
Division of Project Management
Office of Nuclear Reactor Regulation

Attachment:
As stated

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OFFICE	LWR-4	LWR-4	AD:LWR	DPM		
SURNAME	HSilver/lt	SVarga	DVassallo	RBoyd		
DATE	11/29/78	11/29/78	11/29/78	11/30/78		

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Tennessee Valley Authority

NOV 30 1978

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1. We do not feel it necessary for TVA to account for the three sets of strong motion recordings from the Friuli earthquakes characterized by "disappeared traces." However, because of the small size of the present data set, we do feel it necessary for TVA to conduct a sensitivity study showing the general effect of the incorporation of additional records of high levels of ground motion upon the 50th and 84th percentile site specific response spectra and the subsequent calculation of relative probabilities.
2. The staff has requested a study of the relative probabilities of exceedence for the various sets of spectra. Although we do not place great reliance upon the accuracy of the absolute probabilities, we feel that estimates of these probabilities are necessary for the full evaluation of the significance and correctness of the relative probabilities.
3. The staff believes that the probabilities should be calculated assuming (1) the maximum possible intensity for each seismic source is the maximum historical intensity and (2) the maximum possible intensity for each seismic source is the maximum historical intensity plus one.
4. The staff believes that the attenuation function used in the probability calculations should have the following characteristics:

a. The epicentral intensity extend out to 10 kilometers.

b. Beyond 10 kilometers, Bollinger's attenuation function and dispersion calculated for the Charleston Earthquake should be used.

c. The dispersion for the attenuation function should be truncated so as not to exceed the epicentral intensity at any distance.

5. The staff believes that the intensity acceleration-relationship and standard error shown in Equations 2-2 and 2-3 of the CSC report (NUREG-0402) is acceptable for use in the probability study.

6. The staff believes the normalized spectral shape calculated from the TVA site specific study would be acceptable for use in the probability study. This spectral shape would be normalized to a peak acceleration at 33 Hz and used with appropriately calculated dispersion factors for amplifications at other frequencies.

7. Historical intensities used in determining activity rates should be those published in Earthquake History of the U. S. unless other values have been specifically changed and accepted by the NRC staff.

8. In the probability calculations all assumptions and procedures should be clearly described so as to permit efficient evaluation by the NRC staff.

9. The reference describing the scatter associated with the Trifunac-Brady acceleration-intensity relationship is

   - Trifunac, M.D. A Note on the Range of Peak Amplitudes of Recorded Accelerations, Velocities and Displacements with Respect to the Modified Mercalli Intensity Scale, Earthquake Notes, Vol. 47, No. 1, January-March 1976.