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Docket No. 50-309

Mr. John H. Garrity, Senior Director  
 Nuclear Engineering and Licensing  
 Maine Yankee Atomic Power Company  
 83 Edison Drive  
 Augusta, Maine 04336

Dear Mr. Garrity:

Subject: Comments on Seismic Design Review

Enclosed is a copy of our comments on Maine Yankee's Seismic Design Review Program. This program is described in your submittal dated June 21, 1982.

The general approach of this program appears reasonable. However, the scope of the program does not include the systems required to achieve safe (cold) shutdown.

Further details should be provided on your analysis methods and criteria as they are developed and applied, so that appropriate review can be provided at that time.

Sincerely,

Original signed by  
 Robert A. Clark

Robert A. Clark, Chief  
 Operating Reactors Branch #3  
 Division of Licensing

Enclosure  
 As stated

cc: w/enclosure  
 See next page

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Comments on the proposed Maine Yankee "Program to Establish Seismic Safety Margins Using Revised Criteria and Analytical Methods" dated June 21, 1982.

GENERAL COMMENTS

- A. The general approach for seismic evaluation of structures, systems and components stated in this program appears reasonable. However, the scope of the proposed program does not include the systems necessary to achieve safe (cold) shutdown and the accident mitigating systems. Further, it appears premature for the staff to comment on the analysis methods and criteria that will be utilized since the details have not been provided.
- B. The seismological and geological portions of this program appears reasonable and could result in suitable estimates of seismic ground motion for the reevaluation of the plant.

COMMENTS ON EACH TASK

A. Analysis of Plant Structures, Systems and Components

- 1. As required for the seismic reevaluation of SEP Phase II plants, three areas should be considered in Maine Yankee seismic evaluation program, which are: (a) the integrity of the reactor coolant pressure boundary, (b) the integrity of fluid and electrical distribution systems related to safe shutdown and engineered safety features, and (c) the structural integrity and operability of mechanical and electrical equipment and engineered safety feature systems (including containment). It is our recommendation that the licensee evaluate the hot shutdown structures, systems and components to an acceptable seismic level first, and complete the evaluation of the remaining systems subsequently.
- 2. No criteria (neither analysis criteria nor evaluation criteria) to be used was specifically proposed in this program. A set of criteria and guidelines used in SEP Phase II review are recommended:
  - (a) NUREG/CR-003, "Development of Criteria for Seismic Review of Selected Nuclear Power Plants," by N. M. Newmark and W. J. Hall, May 1978.
  - (b) "SEP Guidelines for Soil-Structure Interaction Review," by SEP Senior Seismic Review Team, December 8, 1980. (NUREG/CR-1981, Attachment C)
  - (c) Reevaluation Guideline - Seismic criteria for SEP Group II Plants (excluding structures). (Not currently available)

For the cases that are not covered by the criteria stated above, the following SRPS and RGs are to be used:

- (a) SRP Sections 2.5, 3.7, 3.8, 3.9, and 3.10.
- (b) RGs 1.25, 1.29, 1.60, 1.61, 1.92, 1.100, and 1.122.

3. It is not clear that to what seismic level (SSE or OBE) the plant will be evaluated and upgraded. Also, the "Functionability of Hot Shutdown Systems" is not clearly defined.

B. Application of Several Alternate Means for Seismic Hazard Determination

In the development of site specific ground response spectra by deterministic (empirical) procedures, it is important that the size (magnitude) of the controlling earthquake for the site should be established and that magnitude, distance (25 kilometers or less from recording site to source) and site geology (rock, shallow soil or deep soil) should be modelled by the suite of strong motion records used to obtain the site specific ground response spectra. In the development of site specific ground response spectra by probabilistic methods, it is important that sensitivity studies should be conducted with respect to input parameters such as source zonation, upper magnitude cut-off, recurrence relation, and attenuation functions to help for establishing the range of uncertainty and the significance to be attached to each parameter and the results.

C. Geological and Seismological Studies

In the investigations and evaluations of events and data that occurred or become available after plant licensing, it is important to establish whether assumptions previously made about eastern North American earthquakes as to stress-drop, source dimensions, and magnitude-accelerations, are valid. Also, the geological information about the source areas of these events should be examined and evaluated.

D. Consideration of Ground Motion Monitoring Capability Upgrade

It is not clear whether the licensee is planning to investigate the installation of strong-motion instrumentation, a local earthquake monitoring or both. Its intentions as to the installation of ground motion monitoring equipment should be explained in more detail.

E. Proposed Schedule

The proposed schedule submitted by the licensee in his letter of June 21, 1982, for the following:

1. Analysis of hot shutdown structures, systems and components - July 1983
2. Seismic hazard determination - July 1983
3. Geological and seismological studies - July 1983
4. Consideration of hazard motion monitoring capability upgrade - July 1983
5. Assessment of 1 thru 4 above - end 1983

is acceptable. However, a supplemental schedule should be provided clarifying the time frame for completion of the evaluation of the balance of the safe shutdown and accident mitigating systems.