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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

April 24, 1979

Docket No. 50-29

LICENSEE: Yankee Atomic Electric Company (YAEC)

FACILITY: Yankee-Rowe Atomic Power Station

SUBJECT: SUMMARY OF MARCH 21, 1979 MEETING CONCERNING SYSTEMATIC EVALUATION PROGRAM (SEP) TOPICS FOR YANKEE-ROWE

On March 21, 1979 we met with representatives of YAEC and its consultant, Weston Geophysical. The purpose of the meeting was to discuss the ongoing review of SEP topics related to hydrology, seismic design, and pipe breaks inside containment. A list of attendees is attached.

The following summarizes the highlights of the discussions:

Hydrology

The staff summarized details of the Probable Maximum Flood (PMF) and the Ultimate Heat Sink (UHS) review. The following pertinent reports and independent staff calculations were the basis for the review.

1. Report No. YAEC-1139, "Yankee Nuclear Station - Probable Maximum Flood Analysis," Steven C. Doret, July 1977
   Note: This report includes the 1973 Federal Power Commission dam inspection reports. The report is preliminary and will be docketed when it becomes final.

2. "Inspection Report of the New England Power Company Deerfield River Project," Federal Power Commission Project No. 2323, September 1968.

3. "Third Inspection Report of the New England Power Company Deerfield River Project," Federal Energy Regulatory Commission, 1978.

4. "Analysis/Calculations for Containment of Somerset Reservoir Storage in Harrison Reservoir," YAEC, February 22, 1979.

5. Drawings: 1. Plan of Circulating Water System; and 2. Profile of Circulating Water System.

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The staff's preliminary analyses indicate that the PMF may cause overtopping of the Harriman Reservoir resulting in dam failures at the Harriman and Sherman dams. However, a flood equal to .75 PMF is not expected to cause overtopping. The water level at the site corresponding to the PMF would then be predicted to be above plant grade. These computations made various assumptions regarding the probable maximum precipitation, the infiltration rate, the spillway, area and capacity curves, the unit hydrographs, the river profiles, and topographic features. Better data may help to refine these analyses. The staff is continuing work using the dam break version of HEC-1 code. Depending upon the failure modes of either of these dams and the sequencing of events, the effect at the site may be somewhat mitigated. Based on the results of the analysis expected in a few weeks, the staff will identify future measures required to resolve the issues.

These analyses will also help define the consequences of dam failure due to seismic forces. Pending conclusion of the hydrology review, it will be determined if the dams are to be considered safety related and in turn if dynamic stability analyses will be required to determine their ability to resist earthquakes.

Seismic Design

YAEC summarized the results of scoping structural evaluations of the steel vapor container and the column supports of the massive concrete shielding structure housed within the vapor container.

Initial findings indicate that the vapor container which was designed for a 110 mph wind loading has acceptable seismic capability for at least a 0.1g, R.G. 1.60 seismic input. However, YAEC has not yet looked locally in detail at the hatch and bellows discontinuities.

Based upon a preliminary scoping analysis by YAEC, the joints of the columns supporting the concrete internal shielding structure are features which appear to have lesser seismic capability. YAEC has completed a parametric evaluation assuming various support conditions, each corresponding to a potential mode of strengthening and stiffening of the columns. It appears that modifications will be required to meet an acceptable level of seismic resistance capability. However, YAEC indicated that any modifications will be extremely difficult because of interferences in the area.

YAEC has developed models of the reactor cooling system (RCS) in preparation for the seismic evaluation as requested in our letter dated January 15, 1979. Work will proceed when the seismic input level has been defined by us.

YAEC has agreed to send the NRC staff the following reports:

1. Evaluation of the steel vapor container.
2. Evaluation of the concrete internals supporting structure.
3. Users manual and description of the Yankee-Rowe RCS dynamic model.

NRC representatives explained that emphasis will be placed on demonstrating the seimic capability of the RCS and the reactor building. Additionally, the seismic capability of the safe shutdown systems will have to be evaluated although possibly at a later time after input from other reviews such as the hydrology, fire protection reviews, etc. is received. At such time an integrated look at potential solutions to a variety of identified issues can be made. However, to adequately incorporate the impact of seismic issues on the decision, a certain level of seismic design information must be available. NRC representatives suggested that scoping evaluations of the balance of plant and safe shutdown systems be completed to provide input into the decision making process. After a course of action has been identified, then full scale seismic evaluations to qualify the required existing or possibly new safe shutdown systems could be initiated.

Pipe Breaks Inside Containment

The discussion of SEP Topic III-5.A centered around the guidance provided in our letter to YAEC dated January 2, 1979. YAEC will assess the effects that postulated breaks in high energy piping systems would have on components of essential systems inside the reactor containment. Our guidance letter identified three potential approaches, e.g. (1) a fully mechanistic approach involving the use of stress analysis for postulating break locations, (2) an effect oriented approach which postulates breaks in the immediate vicinity of safety related equipment, and (3) a simplified mechanistic approach which postulates breaks at terminal ends, at each pipe fitting, and

at each weld. YAEC indicated that they may use any one or a combination of the three approaches. Although all three approaches are useful, the effect oriented approach provides immediate benefit for scoping the problem. YAEC was asked to provide a list of all high energy piping inside the containment and to evaluate the effects of postulated pipe breaks in safety related system. YAEC indicated that they already have made a preliminary survey inside the containment of high energy lines and that this effort would be continued. We understand that in the near future YAEC will provide an outline of the proposed program and schedule information in response to our January 2, 1979 letter.

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Attachment:
List of Attendees

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ATTACHMENT

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