



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

April 19, 1983

Honorable Nunzio J. Palladino
Chairman
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Dr. Palladino:

SUBJECT: ACRS REPORT ON THE SYSTEMATIC EVALUATION PROGRAM REVIEW OF THE
YANKEE NUCLEAR POWER STATION

During its 276th meeting, April 14-16, 1983, the Advisory Committee on Reactor Safeguards reviewed the results of the Systematic Evaluation Program (SEP), Phase II, as it has been applied to the Yankee Nuclear Power Station. These matters were also discussed during a subcommittee meeting in Washington, D. C. on February 23, 1983. During our review, we had the benefit of discussions with representatives of the Yankee Atomic Electric Company (Licensee) and the NRC Staff. We also had the benefit of the documents listed.

The Committee has reported previously on its reviews of the SEP evaluations of the five plants in Group 1: Palisades, Ginna, Oyster Creek, Dresden Unit 2, and Millstone Unit 1. The Yankee plant is the first in Group 2 to be reviewed, and differs from the plants in Group 1 in several respects. Whereas none of the plants in Group 1 have yet received a full-term operating license (FTOL), the Yankee plant received an FTOL in June 1961. The plants in Group 1 were all designed and constructed during the period 1963-1971 as compared to a corresponding period of 1955-1961 for the Yankee plant. Yankee is the oldest nuclear power plant still in operation; it has been in commercial operation since 1961. And finally, the Yankee plant with authorized power ratings of 600 Mwt (185 MWe) is much smaller than any of the plants in Group 1, the smallest of which, Ginna, is rated at 490 MWe. All of these differences are pertinent to the NRC Staff's evaluation and our review of the SEP in relation to the Yankee plant. Some, but not all, of these differences exist also between the other plants in Group 2 and those in Group 1.

In our report dated May 11, 1982 on the SEP evaluation of the Palisades plant, we commented on the objectives of the SEP and the extent to which they had been achieved. Our review of the SEP in relation to the Yankee plant has led to no changes in our previous findings regarding the extent to which the objectives of the SEP have been achieved and the manner in which the NRC Staff has conducted its review and assessment.

Of the 137 topics to be addressed in Phase II of the SEP, 24 were not applicable to the Yankee plant and another 24 were deleted because they were being reviewed generically under either the Unresolved Safety Issues

program or the Three Mile Island Action Plan. Of the 89 topics addressed in the NRC Staff's review, 51 were found to meet current NRC criteria or to be acceptable on another defined basis. We have reviewed the assessments and conclusions of the NRC Staff relating to these topics and have found them appropriate.

The 38 remaining topics involved 80 issues relating to areas in which the Yankee plant did not meet current criteria. These issues were addressed by the Integrated Plant Safety Assessment and various resolutions have been proposed. It is of interest to note that the number of topics and issues in this category is not notably greater for the Yankee plant than for the plants in Group 1. However, there are significant differences, relating chiefly to criteria for protection against external events and to the size of the plant, as discussed further below.

For 36 of the 80 issues included in the Integrated Assessment, the NRC Staff concluded that no backfit is required. We concur.

For 10 of the remaining issues, changes to the Technical Specifications or procedures were recommended by the NRC Staff and agreed to by the Licensee.

For the 9 remaining issues for which the assessment has been completed, the NRC Staff has proposed hardware backfits. The Licensee has agreed to all but one of these. The NRC Staff believes that an ammeter should be installed to indicate charge and discharge of the DC battery current in order to ensure the availability of DC power. We believe that this matter should be resolved in a manner satisfactory to the NRC Staff.

As has been the case for the other plants in the SEP, the Integrated Assessment has not been completed for 25 of the issues, for which the Licensee has agreed to provide the results of studies, analyses and evaluations needed by the NRC Staff for its assessments and decisions. All of these issues are of such a nature that hardware backfits may be required for their resolution. The resolution of these issues will be addressed by the NRC Staff in a supplemental report.

Several of the issues requiring further evaluation result from the fact that the Yankee plant was not designed to resist earthquakes, floods or tornadoes at anywhere near the level required by current criteria.

Failure of Harriman Dam would inundate the site. Determination of whether the dam will fail depends on the value assigned to the Probable Maximum Precipitation in the Deerfield River Basin and on the capacity of the spillway for the dam. Both of these questions are in dispute and the NRC Staff has elected to leave their resolution to the National Oceanic and

Atmospheric Administration for the Probable Maximum Precipitation, and to the Federal Energy Regulatory Commission for resolution of the Dam's integrity for both hydrologic and seismic events. We find this approach acceptable.

Although the evaluations have not been completed, it seems almost certain that extensive modifications would have to be made to structures and systems in order to provide the ability to shut the plant down safely following an earthquake or tornado of the magnitude required by current criteria. The Licensee has proposed the design and installation of a dedicated Hot Shutdown System (HSS) that would be able to remove decay heat and maintain primary inventory following an earthquake or tornado that disables all other means of providing these functions. Both the HSS and those systems in the existing plant that must maintain their integrity will be qualified to survive earthquakes and tornadoes with site-specific intensities prescribed by the NRC Staff. The Staff has agreed with the concept of a dedicated HSS and will evaluate its design and report its findings in a supplemental report. We find this approach acceptable.

Although a plant-specific Probabilistic Risk Assessment (PRA) (excluding external events) has been performed by Energy Incorporated for the Licensee, it was not complete and had not been reviewed fully by the NRC Staff at the time the Integrated Assessment was carried out. The NRC Staff's PRA for the Yankee plant included qualitative consideration of the fault trees from the Yankee PRA aided by results and insights from other PRAs. Eighteen of the SEP topics considered in the Integrated Assessment were evaluated for their significance to risk and the results utilized by the NRC Staff in their evaluations. As in previous reviews, we believe that this use of PRA was appropriate and that suitable use was made of the results.

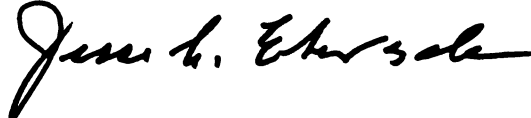
Our conclusions regarding the Yankee SEP review are as follows:

1. The SEP has been carried out in such a manner that the stated objectives have been achieved for the most part for the Yankee plant.
2. The actions taken thus far by the NRC Staff in its SEP assessment of the Yankee plant are acceptable.
3. Several Outstanding Issues, notably those relating to protection against external events, remain to be resolved. We have been informed of the bases for the resolution of these issues but have not yet reviewed them in detail. At this time, we are satisfied with the SEP evaluation of the Yankee plant; we expect to review further the design

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bases for protection against external events, and we wish to review the resolution of the remaining issues when the supplemental report is available.

Sincerely,



Jesse C. Ebersole
Acting Chairman

References:

1. U. S. Nuclear Regulatory Commission, "Integrated Plant Safety Assessment, Systematic Evaluation Program, Yankee Nuclear Power Station," NUREG-0825, dated February 1983
2. U. S. Nuclear Regulatory Commission, Safety Evaluation Reports, Yankee Nuclear Power Station, Volumes 1-4, received February 4, 1983