August 12, 1985

Docket No. 50-309

Mr. J. B. Randazza
Executive Vice President
Maine Yankee Atomic Power Company
83 Edison Drive
Augusta, Maine 04336

Dear Mr. Randazza:

SUBJECT: SAFETY EVALUATION - POST ACCIDENT SAMPLING SYSTEM - NUREG-0737
ITEM II.B.3 FOR MAINE YANKEE ATOMIC POWER PLANT

We have completed the review of your submittals dated April 16 and May 20, 1985 in which you provided additional information on the above subject. Previously, by letter dated October 21, 1983, we informed you that 8 of 11 criteria from NUREG-0737, Item II.B.3 had been met. We now find that all 11 criteria have been met. This item is now considered complete and our Safety Evaluation is enclosed.

Sincerely,

Edward J. Butcher, Acting Chief
Operating Reactors Branch No. 3
Division of Licensing

Enclosure:
As stated

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Mr. J. B. Randazza
Maine Yankee Atomic Power Company

Maine Yankee Atomic Power Station

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
MAINE YANKEE ATOMIC POWER COMPANY
MAINE YANKEE ATOMIC POWER STATION
DOCKET NO. 50-309
POST ACCIDENT SAMPLING SYSTEM (NUREG-0737, II.B.3)

Introduction

In our Draft Safety Evaluation of October 21, 1983, we found that 8 of the 11 post-accident sampling criteria of NUREG-0737, II.B.3 were met. The following criteria were not met:

Criterion (2) Provide a core damage estimate procedure to include radionuclide concentration and other physical parameters as indicators of core damage.

Criterion (5) Meet the requirements for monitoring of chloride.

Criterion (10) Meet the requirement on accuracy, range and sensitivity of the instrumentation.

Evaluation

By letters dated April 16 and May 20, 1985, the licensee provided additional information.

Criterion (2):

The licensee shall establish an onsite radiological and chemical analysis capability to provide, within the 3-hour time frame established above, quantification of the following:

a) certain radionuclides in the reactor coolant and containment atmosphere that may be indicators of the degree of core damage (e.g., noble gases, iodines and cesiums, and non-volatile isotopes);

b) hydrogen levels in the containment atmosphere;

c) dissolved gases (e.g., H_2), chloride (time allotted for analysis subject to discussion below), and boron concentration of liquids;

d) alternatively, have in-line monitoring capabilities to perform all or part of the above analyses.

We find that the licensee meets Criterion (2) by establishing an on-site radiological and chemical analysis capability. The licensee also provided a procedure, consistent with our clarification of NUREG-0737, Item II.B.3, Post-Accident Sampling System (PASS), transmitted to the licensee on June 30, 1982, to estimate the extent of core damage based on radionuclide concentrations and taking into consideration other physical parameters such as core temperature data and sample location.

Criterion (5):

The time for a chloride analysis to be performed is dependent upon two factors: (a) if the plant's coolant water is seawater or brackish water and (b) if there is only a single barrier between primary containment systems and the cooling water. Under both of the above conditions the licensee shall provide for a chloride analysis within 24 hours of the sample being taken. For all other cases, the licensee shall provide for the analysis to be completed within 4 days. The chloride analysis does not have to be done onsite.

The licensee maintains that chloride sampling and analysis within the time period specified is not necessary. However, provisions are incorporated to obtain a sample of primary coolant and perform an analysis on the sample after an accident occurs. The licensee has committed to perform a chloride analysis within the required 4 days after the accident. The licensee is purchasing an ion chromatography which will be delivered later in 1985. The testing will be completed after the fall 1985 refueling, and the procedures and documentation for chloride analysis should be available by June 1, 1986. We find that these provisions and commitments meet Criterion (5) and are, therefore, acceptable.

Criterion (10):

> Accuracy, range, and sensitivity shall be adequate to provide pertinent data to the operator in order to describe radiological and chemical status of the reactor coolant systems.

Boron is the only chemical analysis currently performed on a liquid sample during PASS operations and has been evaluated using the constituents of the standard test matrix, with the exception of the induced gamma radiation field. The effect of an induced gamma radiation field (10^4 rads/gm of coolant) on the analytical method has been independently evaluated. The pH electrodes of the type used in the mannitol titration method for boron have been shown to be stable up to 10^7 rads of cumulative radiation exposure with higher levels tolerated with appropriate calibration. Based upon the diluted matrix source term, the PASS sample volumes at MYAPCo and times of analysis, the cumulative exposures will be substantially less than 10^7 rads.

Currently, PASS operators receive initial training and semi-annual refresher training in post-accident sampling, transport, and analysis. Testing is a part of this training. We find that these provisions meet Criterion (10) and are, therefore, acceptable.

Conclusion

Based on the above evaluation, we conclude that the post-accident sampling system meets all the requirements of Item II.B.3 of NUREG-0737 and is, therefore, acceptable.

Principal Contributor:
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