ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
UNITED STATES ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

January 13, 1972

Honorable James R. Schlesinger
Chairman
U. S. Atomic Energy Commission
Washington, D. C. 20545

Subject: REPORT ON MAINE YANKEE ATOMIC POWER STATION

Dear Dr. Schlesinger:

At its 141st meeting, on January 6-8, 1972, the Advisory Committee on Reactor Safeguards completed its review of the application by the Maine Yankee Atomic Power Company for authorization to operate the Maine Yankee Atomic Power Station at power levels up to 2,440 MW(t). The project was previously considered by the Committee at its 137th meeting, September 9-11, 1971, and at Subcommittee meetings held on July 27, 1971 in Washington, D. C., on August 27, 1971 at the plant site, and on December 20, 1971 in Washington, D. C. During its review, the Committee had the benefit of discussions with representatives of the Maine Yankee Atomic Power Company, Combustion Engineering Incorporated, Stone and Webster Engineering Corporation, the AEC Regulatory Staff, and their consultants. The Committee also had the benefit of the documents listed. The results of the Committee's previous review of this project, at the construction permit stage, are given in its report of July 19, 1968.

The Maine Yankee Atomic Power Station includes a single pressurized water reactor of 2,440 MW(t) power rating. The plant is located on Bailey Point, on the west bank of the Back River in the Town of Wiscasset, Lincoln County, Maine. Condenser cooling water for the unit is drawn from the tidal waters of the river and is returned to the river on the west side of Foxbird Island. The land area around the plant is largely forest and farm land. The town center of Wiscasset, the nearest community, with a present population of about 2,000 is approximately four miles northeast of the plant. The nearest city is Lewiston, Maine, located about 26 miles northwest of the plant.

The applicant stated that he is supplementing the waste treatment systems of the plant by the addition of charcoal filters for radioactive waste gases. This additional equipment should be operative before plant startup and will be used to keep radioactive gaseous waste releases to a small fraction of the 10 CFR 20 limits. The applicant expects that liquid radioactive waste releases in normal operation will be less than the values defined in the recently proposed Appendix I to 10 CFR 50.

The emergency core cooling systems (ECCS) for the reactor have been evaluated using the recently-approved Combustion Engineering Evaluation Model of the AEC "Interim Acceptance Criteria for Emergency Core Cooling Systems for Light-Water Power Reactors." The Committee believes that the indicated performance is satisfactory for the Maine Yankee Reactor. However, the Committee recommends that as the results of additional research and analytical studies become available they should be used by the applicant for evaluation and possible improvement of the system. The applicant's ECCS performance calculations do not as yet include the case of a cold-leg break between the reactor vessel and a closed isolation valve in one loop. The reactor should not be operated at appreciable power levels with a loop isolated until such calculations have been made by the applicant and the results found satisfactory by the Regulatory Staff.

Several welds between austenitic stainless steel sections of the primary system have been found to contain microfissures. Studies by the applicant and his consultants show that microfissures of the type and density found do not impair the serviceability of the welds. Independent studies by the Regulatory Staff and its consultants bear out these conclusions. The Committee believes that these stainless steel weldments in Maine Yankee are acceptable.

The applicant proposes to use a purging technique to control hydrogen build-up in the containment that could follow in the unlikely event of a loss-of-coolant accident. Installation of the purge system should be completed prior to start of routine power operation. The Regulatory Staff should review the design criteria for the system for conformance to engineered safety feature standards.

The Committee reiterates its previous comments on the need to study further means of preventing common mode failures from negating reactor scram action, and design features to make tolerable the consequences of failure to scram during anticipated transients. The Committee believes it desirable to expedite these studies and to implement in timely fashion such design modifications as are found to improve significantly the safety of the plant in this regard. The Committee wishes to be kept informed of the resolution of this matter.

The applicant is improving some details of his analysis of the dynamic response of plant elements to possible seismic forces. The results of these calculations should be reviewed by the Regulatory Staff before operation of the plant at appreciable power levels.

Other problems relating to large water reactors, which have been identified by the Regulatory Staff and the ACRS and cited in previous ACRS reports, should be dealt with appropriately by the Regulatory Staff and the applicant as suitable approaches are developed.

The Advisory Committee on Reactor Safeguards believes that, if due regard is given to the items mentioned above, and subject to satisfactory completion of construction and pre-operational testing, there is reasonable assurance that the Maine Yankee Atomic Power Station can be operated at power levels up to 2,440 MW(t) without undue risk to the health and safety of the public.

Sincerely yours,

C. P. Siess

C. P. Siess
Chairman

References

1. Amendment 14 to License Application for Maine Yankee Atomic Power Station, dated August 27, 1970: Final Safety Analysis Report, Volumes I and II

2. Amendments 15 through 34, to License Application for Maine Yankee Atomic Power Station