

YANKEE ATOMIC ELECTRIC COMPANY
YANKEE NUCLEAR POWER STATION (YANKEE ROWE)
DOCKET NO. 50-29
SAFETY EVALUATION REPORT SUPPLEMENT
SPENT FUEL POOL MODIFICATIONS

INTRODUCTION

In Revision 1 of Supplement No. 3 to Proposed Change No. 158, provided by letter dated August 18, 1980, Yankee Atomic Electric Company (the licensee) incorporated additional design work since its letter of February 7, 1979 (original submittal of Supplement No. 3 to Proposed Change No. 158). Revision 1 discusses permanent changes to the Technical Specifications to permit installation and removal of the temporary gate and shielding panels; the deletion of the permanent division wall; and modifications to the spent fuel rack supports. Reference is made to the Safety Evaluation Report previously issued on April 3, 1979.

DISCUSSION

The changes to the Technical Specifications required to permit installation and removal of the temporary gate and shielding panels are to be made permanent. Previously, these changes to the Technical Specifications were to be temporary.

In the licensee's July 13, 1978 submittal, it was proposed that a permanent division wall be erected in the spent fuel pool to divide the pool into two physically separate volumes. Following the design of the proposed permanent division wall, a detailed thermal analysis of the spent fuel pool with the division wall in place was performed by the licensee to assure that thermal expansion of the division wall would not compromise the structural integrity of the storage pool concrete. The analysis showed that expansion of the

division wall would indeed cause overstress conditions in the storage pool concrete near the floor.

The functions of the division wall were to:

- 1) form the north portion of the liner enclosure;
- 2) provide the capability to dewater and perform maintenance on the fuel transfer equipment; and
- 3) mitigate the consequences of a cask drop accident.

The licensee has determined that these functions can be provided without erecting a permanent division wall.

Instead of erecting the permanent division wall the liner enclosure will be extended to the north wall of the pool. The second function, providing the capability to dewater the fuel transfer equipment will be accomplished by providing a new permanent gate support bracket at the location where the proposed division wall would have gone. With this permanent support bracket in place, the temporary gate may be used to provide a water retaining barrier should the need arise. The licensee indicated that the third function of the proposed division wall, protection against cask drop, might be accomplished by modifying the spent fuel pool building for side entry of the cask and by using suitable energy absorbing barriers. However, details of the cask drop analysis will not be available until Supplement No. 5 to Proposed Change No. 158 is issued. The permanent gate support bracket will be designed, fabricated, installed and tested according to the requirements of ASME Section III, Subsection NF, "Component Supports."

The loading conditions considered were dead load plus hydrostatic and dead load plus seismic. The seismic loads consisted of 0.5g static loads in two horizontal directions and a 0.2g static vertical load. The static load factors were previously accepted by letter from Dennis L. Zieman (NRC) to Robert H. Groce (Yankee Atomic Electric Co.) dated April 3, 1979 for the seismic analysis in lieu of a plant response spectrum which had not been developed for Yankee Rowe. The plant response spectra will be developed by the licensee in accordance with the SEP schedule. The cask drop impact load on the permanent gate support brackets was not considered because the cask drop analysis study had not been complete. The issue of cask drop impact load will be addressed in Supplement No. 5.

In conjunction with installation of the permanent gate support bracket, it is necessary to install a new hatch in the enclosure building roof so that the gate may pass through. This hatch will be installed in the same manner as that described for the central roof hatch in the letter from Yankee Atomic Electric Company to US NRC dated July 13, 1978, Proposed Change No. 158, Supplement No. 1. At the same time the building will be modified to provide for side entry of the spent fuel cask as set forth in the letter from Yankee Atomic Electric Company to US NRC dated July 13, 1978, Proposed Change No. 158. Installation of this hatch and provision for side entry will be accomplished as part of construction Phase 5.

The supports for the proposed second tier of the spent fuel racks consist of structural framework designed, fabricated, installed and inspected according to the requirement of ASME Section III, Subsection NF, "Component Support." The supports are designed to carry dead load plus seismic loads which consist of 0.5g in the two horizontal directions and 0.2g in the vertical direction.

EVALUATION

Pursuant to Revision 1 of Supplement No. 3 to Yankee Atomic Electric Company Letter WYR-78-61 to US NRC dated July 13, 1978 Proposed Change No. 158, the licensee has described additional design work for the spent fuel pool modification. The additional design work included the extension of the stainless steel liner to the north wall of the pool, deletion of the division wall, installation of the permanent gate support brackets, the second tier fuel rack supports, and modification to the enclosure building.

With the deletion of the proposed division wall the stainless steel liner will be extended to the north wall of the pool. The extended liner will be designed to provide a leaktight membrane and conform to the requirements of ASME Section III, Division 2, "Code for Concrete Reactor Vessels and Containments." However, the licensee has committed to perform additional analyses to assure the liner leaktightness following a fuel bundle and cask drop accidents in the fuel handling area of the pool. The remainder of the pool will be protected from a fuel bundle drop by grating placed above the existing spent fuel storage racks.

The permanent gate support bracket will be designed, fabricated, installed and inspected in accordance with the requirements of ASME Section III, Subsection NF, "Component Supports." The loads considered in the bracket design include: dead load plus hydrostatic; and dead load plus seismic. The seismic loads consist of static 0.5g horizontal in the two horizontal directions and 0.2g vertical. The licensee has

committed to perform a more rigorous analysis in accordance with the requirements of Standard Review Plan Section 3.7 once the plant seismic requirements are made available. The design adequacy of the permanent gate support bracket will be assessed for cask drop impact once the cask drop analysis is made available in Supplement No. 5.

The supports for future spent fuel storage racks are completely separate from the existing storage racks. However, on completion of the installation, grating will be placed above the existing spent fuel racks to provide additional protection against a fuel handling accident. The grating and supports will be designed to resist the impact of a fuel assembly dropped from 11 feet above the existing storage racks. The design of the support fixtures will conform to the requirements of ASME Section III, Division 1, Subsection NF, "Component Supports."

In summary, based on our review of the detailed information presented by the licensee on the additional structural modifications we have concluded that:

- 1) the following additional analyses will be provided as requested by the NRC and agreed to by the licensee:
 - (a) cask drop impact load on the permanent gate support bracket and pool liner;
 - (b) fuel bundle drop impact load on the pool liner;
 - (c) seismic analysis on all elements in accordance with NRC Standard Review Plan 3.7 when the seismic requirements are made available;

- 2) all elements will be designed and constructed in accordance with codes accepted by us; and
- 3) conservative assumptions have been made on load magnitudes.

Accordingly, from a structural standpoint, our conclusion based on the information provided in Proposed Change No. 158, Supplement No. 3, Revision 1 is that the proposed modifications will not decrease existing safety margins and are therefore acceptable. However, we will confirm our conclusions when the results of the cask drop analysis, seismic analysis, and the fuel bundle drop analysis become available to ensure that the basis on which our conclusion was founded is completely justified.