

UNITED STATES ATOMIC ENERGY COMMISSION  
HAZARDS ANALYSIS BY THE RESEARCH AND POWER REACTOR SAFETY BRANCH  
DIVISION OF LICENSING AND REGULATION  
IN THE MATTER OF  
YANKEE ATOMIC ELECTRIC COMPANY  
PROPOSED CHANGE NO. 38  
DOCKET NO. 50-29

Introduction

Pursuant to the provisions of Section 50.59 of the Commission's regulations, Yankee Atomic Electric Company in Proposed Change No. 38, dated June 28, 1963, requested authorization of revisions of certain sections of the Plant Maintenance Instructions which are incorporated by reference as part of the Technical Specifications for the reactor. These revisions would permit conducting the Primary Plant Cold Leak Test with spent fuel in the core and the reactor vessel isolated from the heat removal system. The revisions would also permit increasing the minimum temperature at which the leak test may be performed to compensate for the shift in nil ductility temperature of the reactor pressure vessel resulting from neutron irradiation during reactor operation.

Discussion

Yankee has proposed that Condition 4 of Maintenance Instruction 506B3 be changed from:

- "4. Isolation of the reactor vessel and connecting pressurizer system from the heat removal system may be established for the cold leak test period, provided there is not substantial decay heat present in the reactor fuel." to
- "4. Isolation of the reactor vessel and connecting pressurizer system from the heat removal system may be established for the cold leak test period provided the coolant temperature in the vessel does not increase at a rate exceeding 50° F per hour and that the maximum temperature increase during the test period does not exceed 100° F. Temperature monitoring shall be accomplished by means of the in-core thermocouples."

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Precautions 1, 3, and 4 of Maintenance Instruction 506B3 would be changed as follows:

- "1. When the nuclear core is in place, the maximum allowable leak test pressure 2,485 psi gage at a minimum temperature of 90° F." to
- "1. When the nuclear core is in place, the maximum allowable leak test pressure is 2,485 psi gage at a temperature 60° F in excess of the estimated vessel nil ductility temperature."
- "3. Metal-water temperature equilibrium must be obtained in the main coolant system." to
- "3. Full pressurization shall not be effected until the coolant and metal temperatures have reached the test temperature."
- "4. The main coolant system pressure must not exceed 500 psi gage until the temperature of the main coolant is at a minimum of 90° F." to
- "4. The coolant pressure must not exceed 500 psi gage until the coolant is at the test temperature."

We believe that temporary isolation of the reactor vessel from the heat removal system under the conditions proposed would not present any significant change in the safety of performing the cold leak test. Should it become desirable for any reason during the test, the main coolant system stop valves can be automatically opened by the facility operator to reconnect the reactor vessel water with the reactor heat removal system. Further, if a power failure occurred during the test, these valves could be opened manually to allow heat removal from the reactor core.

Yankee has reported that the proposed requirement that the test temperature be at least 60° F above the estimated reactor vessel nil ductility temperature will result in a minimum test temperature of 120° F for the Core III refueling. This minimum temperature would be increased during subsequent core loadings to compensate for the increase in nil ductility temperature caused by the neutron irradiation of the reactor vessel. In our opinion, the proposed new temperature limit is more conservative from a safety standpoint than the present one, and we believe that it provides an adequate safety margin to prevent damage to the vessel during future cold leak tests.

Conclusion

We have concluded that Proposed Change No. 38 does not present significant hazards considerations not described or implicit in the hazards summary report. We have further concluded that there is reasonable assurance that the health and safety of the public will not be endangered.

Original signed  
by Robert H. Bryan

Robert H. Bryan, Chief  
Research & Power Reactor Safety Branch  
Division of Licensing & Regulation

Date: OCT 18 1963