

TOPICAL REPORT EVALUATION

Report Identification: BAW-10035, Rev. 1

Report Title: Fuel Assembly Stress and Deflection Analysis for Loss-of-Coolant Accident and Seismic Excitation

Report Date: December 1972

Originating Organization: Babcock & Wilcox

Reviewed By: Mechanical Engineering Branch, NRC Division of Technical Review

SUMMARY OF TOPICAL REPORT:

The dynamic response of fuel assemblies and fuel support structures due to a postulated reactor coolant break (LOCA) near the outlet nozzle was presented. Axial loads on the control rods and the guide tubes are produced by lifting of the fuel assemblies under the LOCA loads. A simplified non-linear single mass model was used to confirm that the guide tubes will not buckle. A linear nine mass mathematical model was used to compute the vessel and internals responses at the upper and lower grid plates. The nine mass analysis was also used to derive an input for a separate non-linear analysis of the fuel assemblies. Additional testing was conducted to confirm control rod insertion function and to determine the non-linear mechanical behavior of the fuel assemblies. The seismic (DBE) analysis was based upon the use of the El Centro 1940, S-N, time history input and the use of the LOCA dynamic system mathematical models.

SUMMARY OF REGULATORY EVALUATION:

We have reviewed the subject report, including the mathematical models, analysis methods, and the structural design criteria. The functional reliability of the fuel support structures was also evaluated. The fuel assemblies will withstand the combined effects of the LOCA and DBE loading.

REGULATORY POSITION:

The subject report provides an acceptable basis for demonstrating the functional reliability of fuel assemblies to withstand the combined effects of the LOCA and DBE loading. This report is acceptable and may be referenced in license applications for similar 850 MWe class PWR plants with skirt-supported vessels.

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