JUN 12 1987

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Roger Newton, Chairman
Westinghouse Owners Group
Wisconsin Electric Power
231 West Michigan Avenue
Milwaukee, Wisconsin 53201

Dear Mr. Newton:

SUBJECT: ATWS Moderator Temperature Coefficient

One of the important parameters in performing ATWS analyses is the initial moderator temperature coefficient (MTC) of reactivity of the reactor. Initial MTCs were developed in the mid to latter part of the 1970s to support your position on ATWS for your classes of plants. These initial MTCs were based on a number of assumptions over a 40 year life for a plant including, on a cycle-by-cycle basis, such factors as the fuel management strategy which affects fuel types, fuel enrichments, fuel burnups, and fuel placement in the reactor as well as discrete burnable poison loadings and placements in the reactor. Other factors, such as core operational strategy, the number of shutdowns and startups in a cycle, and time at part power operation, affect the initial MTC.

We are concerned about trends in current reload core designs that may lead to initial MTCs that are less conservative for your classes of plants than were assumed in your ATWS analyses. These trends have included, among other things, changes in the fuel management strategy to low leakage reactor cores for the mitigation of Pressurized Thermal Shock (PTS) to the pressure vessel and, for economic reasons, changes in cycle lengths to extended cycles of 18 and 24 months. Discrete burnable poisons are used in these fuel cycles to some extent to control peaking factors, hold down reactivity, and to prevent beginning of cycle MTCs from becoming positive (or too positive in some cases). In addition, few plants, if any, have achieved in their fuel cycles the characteristics of an equilibrium fuel cycle. Some plants have also increased the MTC above 70% power from a zero MTC to a positive MTC that ramps down to zero at 100% full rated power. This type of change appears to have been made for operational convenience, for example, during cycle startup testing. These trends have led the staff to question the continued applicability of previously derived initial MTCs that were used in your ATWS analyses and were used by the staff to develop the ATWS rule.

In order for the staff to assess core design changes which increase the MTC, we need additional information on the effects of these changes, especially as regards the ATWS assumptions. These effects can possibly be assessed generically and definitely require analyses. Therefore, the staff requests that you quantitatively reassess the initial MTC for your classes of plants. This reassessment should include actual plant data from previously completed fuel cycles (many plants have completed or are near their 10th fuel cycle) and all relevant factors for the remaining fuel cycles of the plants. This

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reassessment should develop initial MTCs on the 95% and 99% bases previously used (that is, by a 95% bases initial MTC the staff means that the initial MTC will be more negative than the value assumed for the ATWS analyses for 95% of the plant life for the plants of a class of plants that is being considered). This reassessment should be submitted to the staff by a letter report including, but not limited to, discussions of (1) the assumptions made, (2) the methodology used to derive the initial MTCs, (3) the plant data used, (4) the results obtained, (5) differences in initial MTCs with previously used initial MTCs, and (6) the justification for the continued applicability or conservatism in previously used initial MTCs. Plants that belong to a class of plants but which have unique initial MTCs or can be considered as outliers of that class of plants should be treated and analyzed separately. Therefore, we request that you expedite your response so that we may assess any reductions in ATWS margins.

Please contact Mr. Daniel Fieno at (301) 492-7141 if you have any questions regarding this letter.

Sincerely,

ORIGINAL SIGNED BY A. C. THADANI

Ashok C. Thadani, Assistant Director
for Systems
Division of Engineering & Systems Technology
Office of Nuclear Reactor Regulation

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