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DESCRIPTION:
Ltr furn final report on the requirements in regard to the revision of the Specific Heat Curve for UO ? fuel.....trans the following...

ENCLOSURES:
FIGURES:
LOCA LIMITED MAXIMUM ALLOWABLE LINEAR HEAT RATE.

SPECIFIC HEAT OF UO_2

(1 cy ea encl rec'd)

PLANT NAME: Three Mile Island #1

FOR ACTION/INFORMATION 2-25-74 JB

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Regulatory File Cy.

February 22, 1974

Dr. D. R. Knuth, Director
Directorate of Regulatory Operations
United States Atomic Energy Commission
Washington, D. C. 20545

Subject: Three Mile Island Nuclear Station Unit 1
Docket No. 50-289
Revised Specific Heat

Dear Dr. Knuth:

This is a final report pursuant to the 10 CFR 50.55(e) reporting requirements in regard to the revision of the Specific Heat Curve for UO_2 fuel.

On January 21, 1974, you were notified that Babcock & Wilcox Company was revising the specific heat curve for UO_2 fuel as utilized in some of its transient computer codes for plant safety analyses. This revision was expected to increase the values for specific heat at elevated temperatures. A new specific heat curve has now been issued, following appropriate quality assurance and approval steps, and incorporated into the affected transient codes. The new specific heat curve is attached.

The safety implications of higher values of specific heat were investigated by re-running the various transients. The slower transients were unaffected. The more rapid transients were investigated with the following results:

ROD EJECTION TRANSIENT

The DNBR was not noticeably affected. The maximum cladding temperature decreased by 70°F to 100°F, and the maximum fuel temperature decreased by 200°F to 300°F.

LOCKED ROTOR TRANSIENT

The DNBR was not noticeably affected. The maximum cladding temperature increased by 5°F to 15°F and the fuel temperature fell off at a slower rate. The overall effect of this change is insignificant.

FOUR-PUMP COASTDOWN TRANSIENT

The increased specific heat values had no significant effect on this transient.

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ECCS Analysis

The only significant impact the specific heat revision has on safety limits is the lowering of some portions of the allowable linear heat rate by up to 0.65 KW/ft. This LOCA derived curve determines the allowable linear heat rate as a function of elevation in the core for which the Interim Acceptance Criteria are met. Revised LOCA limits were determined by repeating the Oconee 2 calculations because these analyses are representative of the 177 fuel assembly plants. The allowable heat rate curve on Oconee 2 is lower by 0.65 KW/ft at the six foot elevation, but is unchanged at the ten foot elevation. The revised LOCA limit curve is attached.

REACTOR BUILDING PRESSURE

The initial stored energy in the core is increased by less than one million Btu's; calculation of the Reactor Building Pressure shows no change.

A re-analysis of Three Mile Island Unit 1 operating margins with respect to the revised LOCA limit curve was performed based on the procedures developed in BAW-10078. This analysis shows that the revised LOCA limit would have been violated assuming the licensed design conditions early in life. Based on Oconee 1 and 2 operation, however, these design conditions are known to be conservative and an actual violation would have required the simultaneous existence of several "worst case" uncertainties. In order to ensure that Three Mile Island Unit 1 operates within the revised LOCA limit and to more accurately reflect the operating characteristics of Oconee 1 and 2 experience to date, proposed revisions for the Three Mile Island Unit 1 Technical Specifications will be submitted to the Directorate of Licensing during the week of March 4, 1974.

Very truly yours,

J. G. Miller
Vice President

brh/kg
Att.

CC: Mr. A. Giambusso, Deputy Director for Reactor Projects, Washington, D.C
Mr. J. P. O'Reilly, Directorate of Regulatory Operations, King of Prussia, Pa.
Mr. W. A. Verrochi

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THREE MILE ISLAND UNIT 1

LOCA LIMITED MAXIMUM ALLOWABLE LINEAR HEAT RATE