



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

SEP 17 1979

MEMORANDUM FOR: R. O. Meyer  
Reactor Fuels Section

FROM: D. A. Hoatson  
Fuel Behavior Research Branch

SUBJECT: RIA ENERGY DEPOSITION

The purpose of this memorandum is to confirm our telephone conversations of August 27, 1979, and the meeting with you on August 29, 1979, to discuss the issue of energy deposition in an RIA event.

EG&G had convened a committee to review the methods used at PBF for calibration of reactivity insertion accident (RIA) experiments. At the PBF management meeting on August 24, 1979, they discussed the status of their actions to respond to the committee recommendations. In the course of their work, EG&G noted that there appeared to be a discrepancy between the data base used to derive the limits for RIA fuel damage and the way these limits were applied in Reg. Guide 1.77. In essence, the threshold for severe fuel damage in an RIA was established in SPERT experiments at about 300 cal/gm total energy deposition. To provide some conservatism, a figure of 280 cal/gm was selected as the acceptance criterion. Reg. Guide 1.77, however, refers to 280 cal/gm "radial average fuel enthalpy." The difference between "total energy" and "fuel enthalpy" is that heat transfer from the fuel is permitted under the latter term. One reactor vendor calculates that the energy carried away by heat transfer is about 35% of the total energy. If a vendor calculated energy depositions near the threshold using the "fuel enthalpy" definition, the "total energy" deposition could exceed 300 cal/gm.

A reassessment of the available data is needed to define a threshold in terms of "fuel enthalpy." Future PBF RIA experiments may provide better information of this kind.

It is our understanding that CPB plans to take the necessary actions to resolve the inconsistency between the Reg. Guide 1.77 position and the SPERT data on which it is based.

A handwritten signature in dark ink, appearing to read "D. A. Hoatson".

D. A. Hoatson  
Fuel Behavior Research Branch  
Division of Reactor Safety Research

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R. O. Meyer

-2-

SEP 17 1979

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