March 3, 1994

Docket No. 50-160

Dr. Ratib A. Karam, Director
Neely Nuclear Research Center
Georgia Institute of Technology
Atlanta, Georgia 30332

Dear Dr. Karam:

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION

We are continuing our review of your proposal for your conversion from High-Enriched Uranium (HEU) to Low-Enriched Uranium (LEU) fuel which you submitted on January 21, 1993. During our review of your proposal, questions have arisen for which we require additional information and clarification. Please provide responses to the enclosed Request for Additional Information within 60 days of the date of this letter. Following receipt of the additional information, we will continue our evaluation of your program. If you have any questions on this review, please contact me at (301) 504-1128.

This requirement affects nine or fewer respondents and, therefore, is not subject to Office of Management and Budget review under Public Law 96-511.

Sincerely,

Original signed by:

Marvin M. Mendonca, Senior Project Manager
Non-Power Reactors and Decommissioning
Project Directorate
Division of Operating Reactor Support
Office of Nuclear Reactor Regulation

Enclosure:
As stated

cc w/enclosure:
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UNITED STATES
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WASHINGTON, D.C. 20555-0001

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Project Directorate
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Enclosure:
As stated

cc w/enclosure:
See next page

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REQUEST FOR ADDITIONAL INFORMATION

GEORGIA INSTITUTE OF TECHNOLOGY

CONVERSION FROM HIGH-ENRICHED URANIUM (HEU) TO

LOW-ENRICHED URANIUM (LEU) FUEL

DOCKET NO. 50-160

1. In reference to letter of January 21, 1993, Attachment 2, Section 2.B.,

   A. Describe the bases for the 760 gallons per minute (GPM) limit. Explain how the orifice limits minimum flow in the core to 760 GPM. Describe how this and other flow rates are used in the analyses and how these flow rates are ensured.

   B. In order to ensure that the information used in the analysis is in docketed material, reference "1a" should be:

      Letter, R. A. Karam to Director, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, January 21, 1993, Attachment 1 "Analyses for Conversion of the Georgia Tech Research Reactor from HEU to LEU Fuel," J. M. Matos, S. C. Mo, and W. L. Woodruff, Argonne National Lab., September 1992.

2. In reference to letter of January 21, 1993, Attachment 3.1 (Table 2.1 Reactor Design Data) under topic "Heat transfer"

   A. Thermal conductivity, U_3Si_2 is given as 51.99 Btu/hr-ft-°F. In NUREG-1313 page 6 it is given as 52 W/m-°K. Provide the reason for the difference, the impact of the difference and any needed corrections.

   B. Thermal conductivity of Al is given as 104 Btu/hr-ft-°F. In 53rd Edition of the "CRC Handbook of Physics and Chemistry," page E-10 at 350 to 400 °K it is given as 2.40 W/cm-°K or about 140 Btu/hr-ft-°F. Provide the reason for the difference, the impact of the difference and any needed corrections.

3. In reference to letter of 1/21/93, Attachment 1, page 5, Table 1, fuel meat dimensions specifies a range of 58.9-62.8 mm for width. Also ranges of 584-610 mm for HEU and 572-610 mm for LEU fuel meat length were listed. Provide the reason for the range. Also, provide the method used to model the range of material dimensions in your safety analyses, such as in engineering uncertainty analyses.

4. Discuss in more detail the criteria used to determine when flow instability commences and when departure from nucleate boiling occurs. Provide the equations and correlations used for this calculation. Provide the reason that these equations and correlations are appropriate for the analyzed conditions (e.g., ranges of applicability with reference to associated data).