

June 10, 1988

Docket No. 50-186

Dr. Robert M. Brugger, Director
Research Reactor Facility
University of Missouri
Columbia, Missouri 65211

Dear Dr. Brugger:

SUBJECT: NRC REVIEW OF EXTENDED LIFE ALUMINIDE FUEL (ELAF) AMENDMENT
APPLICATION

We are continuing our review of your application to Facility License No. 9-103 for permission to use ELAF in your reactor. The application was submitted by letter dated September 12, 1986, as supplemented. During our review of the information you had submitted, questions have arisen for which we require additional information and clarification. please provide responses to the enclosed Request for Additional Information within 30 days of the date of this letter. Following receipt of the additional information we will continue our evaluation of your request. If you have any questions regarding this review, please contact me at (301) 492-1121.

The reporting and/or recordkeeping requirements contained in this letter affect fewer than ten respondents; therefore, OMB clearance is not required under P.L. 95-511.

Sincerely,

Original Signed By:

Alexander Adams, Jr. Project Manager
Standardization and Non-Power
Reactor Project Directorate
Division of Reactor Projects III,
IV, V and Special Projects
Office of Nuclear Reactor Regulation

Enclosure
As stated

cc: See next page

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

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Sincerely,

A handwritten signature in cursive script, appearing to read "Alexander Adams, Jr.".

Alexander Adams, Jr. Project Manager
Standardization and Non-Power
Reactor Project Directorate
Division of Reactor Projects III,
IV, V and Special Projects
Office of Nuclear Reactor Regulation

Enclosure
As stated

cc: See next page

University of Missouri
at Columbia

Docket No. 50-186

cc: University of Missouri
Associate Director
Research Reactor Facility
Columbia, Missouri 65201

A-95 Coordinator
Division of Planning
Office of Administration
P. O. Box 809, State Capitol Bldg.
Jefferson City, Missouri 65101

REQUEST FOR ADDITIONAL INFORMATION
UNIVERSITY OF MISSOURI - COLUMBIA

The MURR submittal of March 11, 1988 has been reviewed and the following concerns have been identified where additional information is required to assess the technical basis. The areas are:

- (1) In Table 4.1 on enthalpy rise, safety limits basis, an overall product of 8.81 is reported. This appears to be a typographical error. Please address.
- (2) In the last sentence of page 16, the sentence reads, "...by changing the maximum acceptable DNBR:". This appears to be a typographical error. Please address. It is suggested that the corresponding COBRA DNBR be given for the new fuel design. Table 4.2 indicates that COBRA is predicting approximately a 6 percent greater margin than the BOLERO safety limits. Will the COBRA minimum DNBR reflect this difference?
- (3) The responses by MURR of September 11, 1987 and March 11, 1988 address the response to a reactivity perturbation with increased oxide. These discussions indicate that more severe results are obtained with a particular inlet temperature, two PARET/ANL channels, original PARET CHF code, and the Bergles and Rohsenow correlation for the onset of nucleate boiling and transition to fully developed nucleate boiling.

To aid in the evaluation of the new fuel acceptability for 10 MW operation, it is requested that sensitivities be reported for the following variables:

- (a) CHF correlation
- (b) Onset of nucleate boiling correlation

- (c) Inlet temperature
 - (d) Coolant flow velocity (benchmarking reported for PARET/ANL is for natural convection flow)
 - (e) Modeling of new fuel with hot plate (4) as channel 1, and remainder as channel 2.
 - (f) Moderator direct heating percent.
- (4) It is requested that the deviation of the PARET/ANL feedback input for channel 7 and channel 2 be submitted as a part of the request for approval. The void feedback is strongly dependent on fuel element coolant channel position and the PARET results are derived only with $\Delta k/\%$ void.