



UNIVERSITY OF MISSOURI

Research Reactor Facility

Research Park
Columbia, Missouri 65211
Telephone (314) 882-4211

February 23, 1990

Office of Nuclear Reactor Regulation
Division of Reactor Projects
U. S. Nuclear Regulatory Commission
Mail Station P1-137
Washington, D. C. 20555

ATTENTION: Document Control Desk

REFERENCE: Docket 50-186
University of Missouri Research Reactor
License No. R-103

SUBJECT: Responses to Request for Additional Information dated
January 25, 1990

Dear Sir:

The University of Missouri Research Reactor (MURR) provides the following responses to the Nuclear Regulatory Commission letter of January 25, 1990 requesting additional information required to evaluate our license amendment application dated December 26, 1989.

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The two requests for information and our responses are attached. If you have any questions concerning our responses, please contact me at (314)-882-5293 or Charlie McKibben at (314)-882-5204.

Respectfully submitted,

Roland A. Hultsch
for W.A. Meyer, Jr.

W. A. Meyer, Jr.
Reactor Manager

Reviewed and Approved

J. C. McKibben

J. C. McKibben
Associate Director

Attachment

STATE OF MISSOURI)
COUNTY OF BOONE)

On this 23rd day of February, 1990, before me personally appeared J. C. McKibben to me known to be the person who signed the foregoing document.

Subscribed and sworn to before me.

Sharon Wasselman
Notary Public

My Commission expires: 2-23-90.

Sharon Wasselman, Notary Public, State of Missouri
My commission expires February 21, 1991
Boone County, Missouri

INFORMATION REQUEST #1:

Assuming that the University of Missouri at Columbia Research Reactor (MURR) is unable to acquire a shipping cask, please estimate the date at which operation of the reactor would have to be terminated under the existing license possession limits.

RESPONSE:

It is difficult to define an absolute date at which operation of the reactor would have to be terminated with respect to existing license possession limits. Under the existing license possession limit for U-235 (45 kg), MURR has already begun modifying the schedule for receipt of new fuel. We will receive our scheduled four elements in March 1990, however planned shipments of four elements in April and June will be reduced to two elements. The planned August 1990 shipment must be cancelled altogether (See Figure 1).

By September 1, 1990, MURR will have received eight new elements in 1990, instead of the scheduled sixteen. At this time, insufficient fuel inventory will be available to consistently make cores with enough excess reactivity to run at 10 MW for 6.3 days/week as our programs and other national programs we support have required since September 1977.

Starting in September 1990, the fuel inventory with the existing license possession limit (45 kg) will dictate two refuelings each week and by early 1991, more than two refuelings each week. Obviously, the reactor could continue to operate on into mid and late 1991 if programs could be sustained with multiple refuelings per week. Unfortunately, they cannot.

The current operating schedule with one refueling outage per week is required to support MURR programs such as those that currently provide high specific activity radioisotopes for patient therapy and medical research to MURR researchers and collaborators, the Oak Ridge National Laboratory Nuclear Medicine Group, and more recently to the Cintichem Radiochemical Division.

These programs all require a consistent supply of high specific activity radioisotopes to produce radiopharmaceuticals upon which physicians and patients depend. Over the last two years, MURR has been the primary or backup source for virtually all medical isotopes produced in the United States.

Since operation of the reactor is based on supporting these programs that require virtually continuous reactor operating schedules, a feasible limit for ceasing reactor operation will be reached in advance of an absolute time after which operation would cease due to insufficient fuel inventory to take the reactor critical. If reactor operating schedules ceased to support the programs that currently require extended operating schedules, the reactor would cease operation. This date is estimated to be as early as mid 1991.

INFORMATION REQUEST #2:

The fuel possession quantity timeline that was submitted with your application runs until December 1990. However, your request for amendment involves a temporary increase in possession limit until January 1, 1992. Please provide possession estimates through January 1992.

RESPONSE:

Figure 2 shows estimated U-235 possession through January 1992, if the temporary increase in possession were approved. The possession limit (60 kg) requested in our letter of December 26, 1989 will be reached before January 1, 1992. We therefore, would like to change the termination date of the temporary increase in possession limit to May 31, 1991 instead of January 1, 1992, consistent with the 60 kg temporary possession limit requested. As stated in our December 26, 1989 letter, if spent fuel is shipped before May 31, 1991, MURR will apply for a license amendment to return the possession limit to 45 kilograms.

Fig. 1

Legend

Burnup in regular operation.

Receipt of new fuel,
0.77 cm vertical scale
per fuel element.

Shipment of spent fuel,
or return of one (0.77 cm)
unirradiated fuel element.

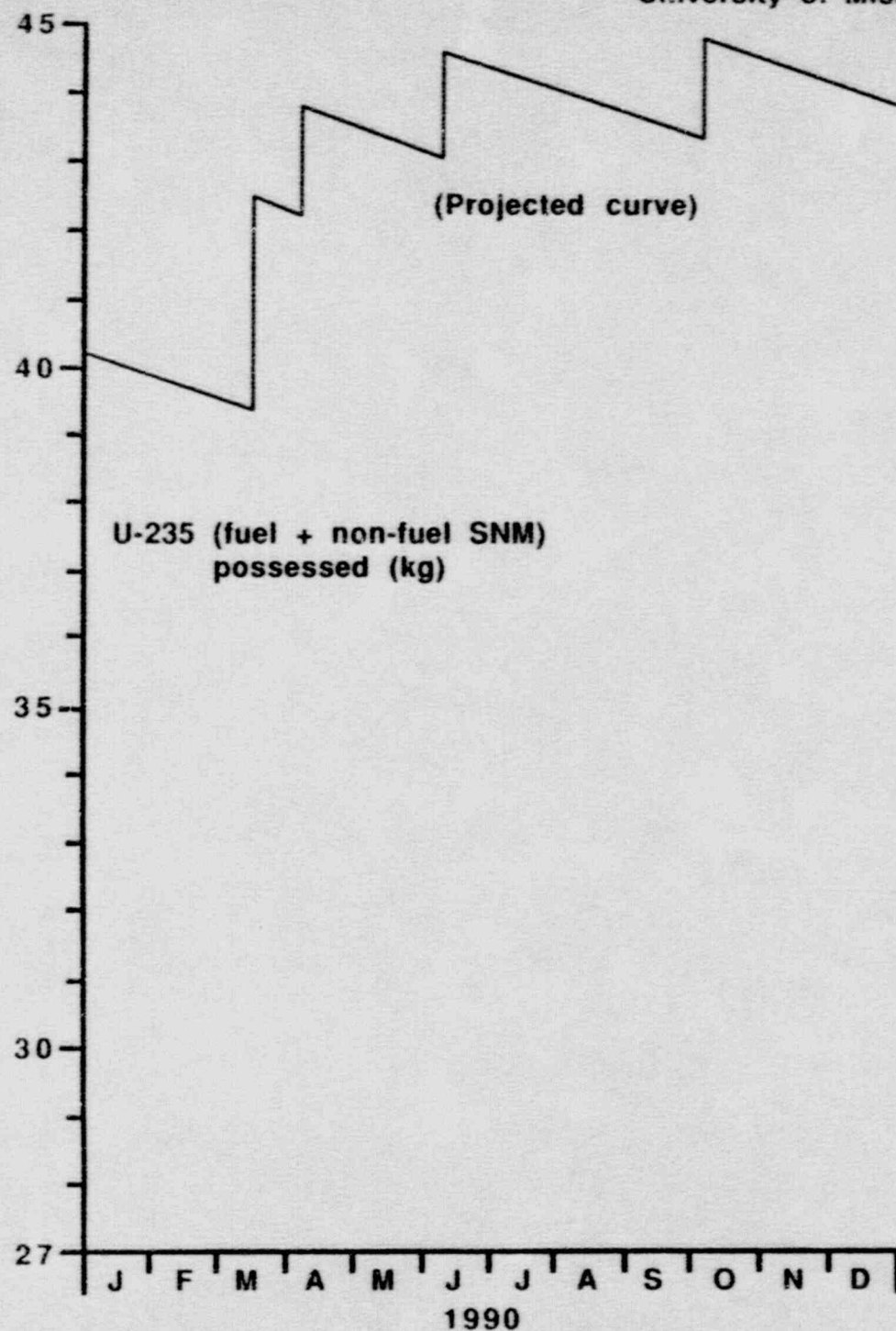


Fig. 2