



UNIVERSITY OF MISSOURI-COLUMBIA

Research Reactor Center

Research Park
Columbia, Missouri 65211
Telephone (573) 882-4211
FAX [573] 882-3443

February 27, 1998

US Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

REFERENCE: Docket No. 59-186
The Curators of the University of Missouri
License No. R-103

SUBJECT: Follow-up Information to the January 8, 1998 letter concerning
unanticipated reactivity insertion.

Dear Sir:

The University of Missouri Research Reactor (MURR) sent a letter dated January 8, 1998 to the NRC concerning an unanticipated reactivity insertion. Under follow-up actions MURR stated that the control blades and their drive mechanisms would be pulled and inspected during the maintenance periods in January and February. MURR has already removed and inspected two of the four control blades and drive mechanisms and found no problems in the blades or drives.

The second mechanism inspected had rod drop times which had increased to longer than were normal but were within technical specification limits, this had been discussed with the NRC inspector during his January inspection. This mechanism was replaced and subsequent rod drop times have been normal. If bubbling from a control blade caused the event, it would most likely have been control blade A because of its location. It was inspected first and there were no abnormalities noted with the blade. As discussed with Mr. Alexander Adams, USNRC, on February 20, 1998, MURR has decided to inspect the last two mechanisms at their normal replacement intervals. Control blade B will be replaced in April or May and control blade D in October or November. This will help us reduce the radiation exposures to personnel, an ALARA consideration, and the likelihood that the reactivity insertion was caused by the control blades is very remote.

The NRC inspector noted also the sticking of the chart recorder pen for the power range channel 5 in his January inspection report. In November 1998, the decision had been made to replace channel 5 and 6 chart recorder. The new recorder will resolve the problem with the channel 5 and 6 recorder pens sticking. The new recorder is in hand and is being bench tested. When the safety review is completed it will be installed.

9803040325 980227
PDR ADDOCK 05000186
PDR



40036



40
AD20

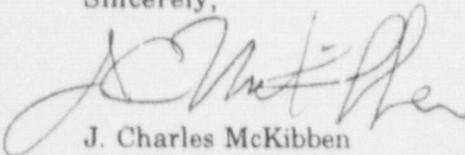
February 27, 1998

Page 2

The reactor physicist has performed additional computer modeling using MCNP to test the feasibility of the hypothesis that a large gas bubble being released from a wedge caused the unanticipated reactivity transient and corresponding nuclear instrumentation indication. The modeling involved comparing a base case to cases with voids in the water in either the control rod gap or water gaps in the graphite reflector region. The control rod gap void model indicates that a positive reactivity insertion would result from a void in this region. Voids in either region showed an improved coupling between the channel 4 and 6 detector region and the reactor core, i.e., more thermal neutrons around the detector for the same reactor power level. These results support our earlier hypothesis, but the changes are small with significant statistical uncertainty.

Effective February 2, 1998, Mr. Walter Meyer was promoted to Assistant Director for Reactor Income Operations and Mr. Anthony Schoone assumed the position of Acting Reactor Manager. Mr. Schoone has been the Reactor Operations Engineer since April 1989 and in the absence of Mr. Meyer would serve as Acting Reactor Manager.

Sincerely,



J. Charles McKibben
Associate Director

xc: Mr. Alexander Adams, Jr., USNRC
Mr. Tom Burdick, NRC Region III
Dr. Edward Deutsch
Reactor Advisory Committee
Reactor Safety Subcommittee