



UNIVERSITY OF MISSOURI-COLUMBIA

Research Reactor Facility

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November 30, 1995

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

REFERENCE: Docket No. 50-186  
The Curators of the University of Missouri  
License No. R-103

SUBJECT: Reply to a Notice of Violation [Violation No. 50-186/95003-01 (DNMS)] in  
Accordance with 10 CFR 2.201

Dear Sir:

This is a written statement required by 10 CFR 2.201 in response to the November 2, 1995 US NRC Region III Notice of Violation [NRC Inspection Report No. 50-186/95003 (DNMS)] concerning events at the University of Missouri Research Reactor (MURR).

One Severity Level IV violation was identified requiring a written response.

**Violation**

During an NRC inspection conducted from October 2-6, 1995, a violation of NRC requirements was identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," NUREG-1600 (60 FR 34381; June 30, 1995), the violation is listed below:

Technical Specification 6.1 (b) requires written procedures for normal operation of the reactor, radiological control and shipping of byproduct material produced under the reactor license.

Health Physics Procedure (HP-40), "Survey of Items for Unrestrictive Use) requires that potentially contaminated materials be surveyed prior to their release from the MURR center. Specifically, Section 3.6, states the "Items noted to produce a positive indication of radioactivity above background will not be conditionally released."

Contrary to the above, as of October 5, 1995, four lead containers (pigs) were released unconditionally to a "clean lead" recycle bin located outside the MURR restricted area with readings ranging from a few hundred to 3000 counts per minute (cpm) above background.

**Reply**

- 1. Reason for the violation or basis for disputing the violation.

On October 5, 1995 a US NRC Inspector and a MURR Health Physics Technician performed a contamination survey of approximately 40 items contained in a lead recycle bin on the MURR loading dock. The recycle bin was located on the portion of the loading dock outside of the restricted area. The survey was performed with a GM meter using a pancake type



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probe. Four lead items were found to be contaminated above the limits specified in Standard Operating Procedure HP-40, "Survey of Items for Unrestricted Release." The contaminated items were lead containers of types commonly used to store reactor licensed material in laboratories and other areas of the reactor facility. As per procedure identifying labels had been removed along with radioactive material labels prior to removing the containers from the restricted area, therefore no specific origin could be identified. The lead containers were subsequently analyzed by gamma spectroscopy and the contamination was identified as cobalt-60, europium-152, and cesium-137. These are long lived isotopes associated with many irradiations performed at MURR.

The recycled lead is used to make new lead containers for use by MURR. The smelting and molding of these new containers takes place at the University of Missouri Science Instrument Shop located about 50 yards across the parking lot from MURR. In the past, every two to three months the contents of the recycle bin was transferred by a MURR employee to a storage area outside the Science Instrument Shop near where the smelting took place.

The root cause of the violation was identified as inadequate training on Standard Operating Procedure HP-40, "Survey of Items for Unrestricted Release." This procedure states that equipment which has been located in a posted area shall be surveyed prior to release. An adequate contamination survey of the lead containers had not been performed.

Although the contaminated containers were outside the MURR restricted area, the potential health risk to members of the general public was very low. The total amount of radioactive material present was a fraction of a microcurie.

2. Corrective steps that have been taken and results achieved.

The contaminated lead containers were immediately moved to the MURR restricted area and labeled contaminated. The entire contents of the lead recycle bin and the bin itself were thoroughly surveyed and no further contamination was found. The storage location for the recycle bin has been moved into the MURR restricted area. A storage area for lead will no longer be maintained on the loading dock and material collected for recycling will be surveyed immediately prior to release.

Complete surveys of both MURR loading docks and the lead smelting area of the Science Instrument Shop were performed and no contamination was found. The contents of the lead recycle bin located inside the Science Instrument Shop was also surveyed. Out of the approximately 125 items in the bin one contaminated lead container was identified. The isotopes and their contamination levels identified on this lead container were similar to what was found on the containers located on the MURR loading dock. The last transfer of material from MURR to this location occurred in July or August of this year. Interviews of the Science Instrument Shop employees indicate that only MURR employees transfer lead to the storage bin outside the shop and it is not used by other University departments. When the lead is smelted to fabricate new shielding it is done in a manner that protects the operator from inhaling the lead fumes. If a contaminated item had been smelted in the past, internal exposure to the operator would not be expected. The Science Instrument Shop employees who operate the smelter are trained radiation workers under the MURR reactor license.

Following the discovery of the contaminated lead Health Physics personnel received retraining on the release of potentially contaminated material from the facility. The training included performance based evaluations of the individual's understanding of SOP HP-40 as well as equipment selection and technique used to perform contamination surveys.

The Reactor Manager and Health Physics Manager have met with 14 of the 16 operational and research groups to discuss the appropriate procedures for removing items from MURR. The number of people attending each training session is limited to encourage participation. The individual's responsibility for following procedures is stressed.

3. Corrective steps that will be taken to avoid further violations.

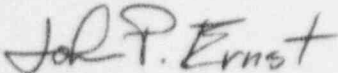
The Reactor Manager and Health Physics Manager are scheduled to meet with the remaining two research groups to complete the retraining program the first week of December.

Instruction on the procedure for removal of items from MURR is included in the initial indoctrination training given to all personnel with unescorted access to the facility. This instruction is updated annually. The subject will continue to be a part of the training program provided to all radiation workers at MURR and will receive special emphasis in the future.

4. Date when full compliance will be achieved.

MURR is in full compliance with Federal Regulations relating to the violation at this time.

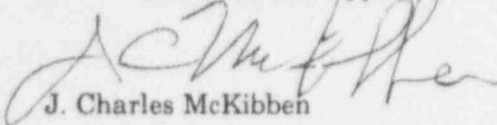
Sincerely,



John P. Ernst  
Manager, Health Physics

ENDORSEMENT:

Reviewed and Approved



J. Charles McKibben

cc: Regional Administrator, Region III