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UNIVERSITY OF MISSOURI RESEARCH REACTOR

OPERATIONS MONTHLY SUMMARY

January 1995

Prepared by:  
Operations Staff

FEB 22 1996

January 1995

The reactor operated continuously in January with the following exceptions: five shutdowns for scheduled maintenance and refueling. There were no unscheduled shutdowns this month.

Major maintenance items for the month included: replacing cooling tower cell #2 north distribution valve stem; rebuilding pool pump 508A.

### OPERATION SUMMARY

HOURS OPERATED THIS PERIOD	682
TOTAL HOURS OPERATED	185,771
HOURS AT FULL POWER THIS PERIOD	680
TOTAL HOURS AT FULL POWER	182,809
INTEGRATED POWER THIS PERIOD	284 MWD
TOTAL INTEGRATED POWER	70,317 MWD

### MAINTENANCE ACTIVITY

1/3/95	Refueled - removed core 94-58, loaded core 95-1. Replaced cooling tower cell #2 north distribution valve stem.
1/9/95	Refueled - removed core 95-1, loaded core 95-2.
1/17/95	Refueled - removed core 95-2, loaded core 95-3.
1/23/95	Refueled - removed core 95-3, loaded core 95-4. Rebuilt pool pump 508A.
1/30/95	Refueled - removed core 95-4, loaded core 95-5.

January 18, 1995

EA 93-058

University of Missouri  
ATTN: Dr. James J. Rhyne  
Director, Research Reactor  
Facility  
Research Park  
Columbia, MO 65201

SUBJECT: NOTICE OF VIOLATION, UNIVERSITY OF MISSOURI (NRC INSPECTION REPORT  
NO. 50-186/94002)

Dear Dr. Rhyne:

This will acknowledge receipt of your letter dated December 21, 1994 in response to our letter dated November 23, 1994 transmitting a Notice of Violation associated with inadequate procedures and training for packaging radioactive waste materials for transportation at the University of Missouri-Columbia Research Reactor Facility.

We have reviewed your corrective actions and have no further questions at this time. These corrective actions will be examined during future inspections.

Sincerely,

~~Original Signed by Roy J. Cerlano~~

W. L. Axelson, Director  
Division of Radiation Safety  
and Safeguards

Docket No. 50-186

cc: Dr. William Vernetson, Director  
of Nuclear Facilities

Distribution

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UNIVERSITY OF MISSOURI-COLUMBIA

Research Reactor Center

Research Park  
Columbia, Missouri 65211  
Telephone (314) 882-4211  
FAX (314) 882-3443

December 21, 1994

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

REFERENCE: Docket 50-186  
University of Missouri Research Reactor  
License R-103

SUBJECT: Reply to a Notice of Violation 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 23, 1994 US NRC Region III Notice of Violation [NRC Inspection Report Nos. 50-186/93001(DRSS); 50-186/94002 (DRSS); EA 93-058] concerning events at the University of Missouri Research Reactor (MURR).

Two violations were identified: only one requires a written response.

#### Violation Requiring a Licensee Response

B. On May 5, 1994, the licensee delivered to a carrier for transport radioactive materials (a decommissioned irradiator case) in a package that was not designed and prepared for shipment so that under conditions normally incident to transportation the radiation level does not exceed 200 millirem per hour at any point on the external surface of the package. Specifically, the package arrived at its destination with a radiation level of approximately 600 to 800 millirem per hour on the bottom external surface.

#### Reply

##### 1. Admission or Denial of the Alleged Violation

This violation is admitted. MURR was in contact with NRC Region III by telephone on May 6, 1994 concerning the problems with this shipment. Written reports were submitted to the US Department of Transportation on May 19, 1994 and June 3, 1994. A written report was submitted also to the State of Tennessee, Division of Radiological Health on June 3, 1994. Additional information was supplied by the licensee during a September 29, 1994 Enforcement Conference conducted at NRC Region III offices in Lisle, Illinois.



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DEC 27 1994

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2. Reasons for the violation if admitted

The reason for the violation was the failure to have in place adequate waste packaging procedures to ensure that contents of the waste container could not shift and result in an increase in the dose rate on the bottom of the package. In addition, training for personnel responsible for the shipment of radioactive waste was inadequate.

The high dose rate on the bottom of the package was caused by three activated metal parts that apparently had vibrated loose and migrated to the floor of the container during transport. A more thorough survey of each of the waste items as it was loaded into the container may have identified these discrete point sources. Additional blocking and bracing might have prevented the waste from shifting. Although the package was classified as a Type A shipment, it met all the criteria of an exclusive use, Low Specific Activity shipment. No intermediate unloading or loading of the vehicle occurred during shipment, and the radiation levels at the package destination were within the limits for an exclusive use shipment.

When formed in 1992 to evaluate isotope shipments from MURR, the Shipping Task Force did not include the category of low level radioactive waste in the scope of its review. A review of the MURR radioactive waste shipping program by the Shipping Task Force may have identified the weaknesses in procedures and training.

3. Corrective steps that have been taken and results achieved

MURR took immediate responsibility for investigating the cause of the change in dose rate on the package, and took steps to correct the problem and minimize the potential exposure to the public and personnel at the waste processor. The same day MURR was informed of the problem with the shipment, a representative of the University was available in Oak Ridge, Tennessee to verify dose measurements and, if needed, assist with the investigation. When the waste processor was prepared to open the package on May 19, 1994, MURR had a Health Physicist on site to help with identifying waste components and identifying the cause of the elevated dose rate.

MURR made no additional waste shipments until the staff completed an evaluation of the problems associated with this shipment and implemented the appropriate corrective measures. Procedures were reviewed and revised to correct the weaknesses identified. Waste shipping personnel received training on the new procedures and the lessons learned from the shipment in question. Revisions to the procedures include specific instructions for more detailed surveying of waste material as it is loaded in the container. These procedures emphasize identifying material that may require special treatment prior to shipment. Proper blocking and bracing of the waste in the package is also addressed.

Formal training has been improved for MURR waste shipping personnel in the processes and procedures associated with radioactive waste shipping. Waste shipping personnel attended the "Hazardous Waste Management Summer Institute" which covers 49 CFR requirements, and a member of the MURR staff attended the four day

"Radioactive Waste Packaging, Transportation, and Disposal Workshop" presented by Chem-Nuclear Systems, Inc the week of November 14, 1994.

Subsequent radioactive waste shipments have been made by the retrained personnel using the revised procedures. The documentation associated with these shipments was reviewed by NRC personnel during a reactive inspection the week of August 15, 1994, and no violations were noted. In addition, two representatives of the US Department of Transportation inspected the MURR hazardous materials shipping program during the week of December 5, 1994. Their inspection included a review of waste shipments and no violations were identified.

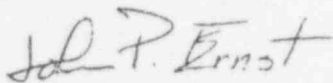
4. Corrective steps that will be taken to avoid further violations.

As a result of the problems with the shipment in question, the MURR Shipping Task Force has broadened the scope of its responsibilities. The Task Force now reviews all types of radioactive material shipments including waste and spent fuel. A single shipping group now has responsibility for final review of the paperwork and documentation associated with all radioactive shipments leaving MURR.

5. Date when full compliance will be achieved.

The University of Missouri Research Reactor believes it is in full compliance at the present time and has been since procedures were revised and training completed in June of 1994. There have been no problems identified with regard to radioactive waste shipments since May 6, 1994.

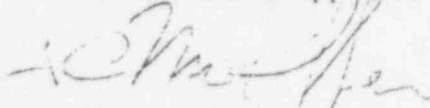
Sincerely,



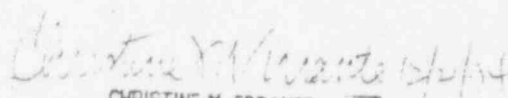
John P. Ernst  
Manager, Reactor Health Physics

ENDORSEMENT:

Reviewed and Approved



J. Charles McKibben  
Associate Director



CHRISTINE M. ERRANTE  
NOTARY PUBLIC STATE OF MISSOURI  
DOCKE COUNTY  
MY COMMISSION EXP. APR. 14, 1995

xc: Regional Administrator, US NRC Region III  
S. Weiss, NRC/NRR  
Reactor Advisory Committee  
Reactor Safety Subcommittee  
J. McCormick, Interim Vice Provost  
J. Rhyne