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March 31, 2004

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Mail Station P1-37
Washington, D.C. 20555

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

SUBJECT: Written communication specified in 10 CFR 50.4(b)(5) requesting U.S. Nuclear Regulatory Commission approval of changes to the Missouri University Research Reactor Emergency Plan pursuant to 10 CFR 50.54(q)

Attached are the proposed changes to the Missouri University Research Reactor (MURR) Emergency Plan and the justification for each change. Additionally, the revised pages to the Emergency Plan are included to help put the proposed changes in context.

The proposed changes request the removal of all references in the MURR Emergency Plan to the Transuranic Management by Pyropartitioning Separation (TRUMP-S) Research Project and its materials. MURR ceased conducting this experiment in 1997. All materials associated with this project have recently been accepted by and shipped to the Department of Energy (DOE). Our materials license no longer includes the quantity of materials that warranted the Nuclear Regulatory Commission (NRC) Memoranda and Orders detailed below. It is our understanding that NRC action will need to be taken for these Memoranda and Orders to be rescinded as part of NRC review and approval of the requested changes.

The TRUMP-S experiment was conducted at the facility in the 1990s under MURR Project Authorization ML-4. This project required amendments to the facility's Special Nuclear Material and Source Material License No. SNM-247 (Amendment No. 12 was granted on March 19, 1990) and to the Broad Scope Byproducts License No. 24-00513-32 (Amendment No. 74 was granted on April 5, 1990). On July 7, 1993, at the request from the University, the NRC terminated License No. SNM-247. On that same date the NRC included the SNM materials in the University's newly issued Broad Scope Materials License, No. 24-00513-39.

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The MURR Emergency Plan was revised on December 20, 1995, to incorporate NRC Memoranda and Orders CLI-95-01 dated February 28, 1995; CLI-95-08 dated June 22, 1995; CLI-95-11 dated August 22, 1995; and CLI-95-17 dated December 14, 1995, in order to support this project.

On September 30, 1997, MURR ended all experiments associated with the TRUMP-S research project. By July 20, 1998, all low-level waste from the project was shipped and final verification surveys documenting the decommissioning of the facilities were completed. All transuranic ("TRU", i.e., americium, neptunium, and plutonium) waste was shipped from MURR on May 15, 2003, for eventual disposal at the Waste Isolation Pilot Plant (WIPP) near Carlsbad, New Mexico.

A recent renewal of the Broad Scope Materials License, No. 24-00513-39, effective December 22, 2003, included a reduction in the possession limit for radioisotopes associated with the TRUMP-S project. As a result of this reduction, the possession limits in our current Broad Scope Materials License include no radioisotope quantities that exceed the 10 CFR 30.72, Schedule C quantities that require consideration of the need for an Emergency Plan.

If you have any questions regarding these proposed changes, please contact me at (573) 882-5276.

Sincerely,

Les Foyto
Reactor Manager

ENDORSEMENT:
Reviewed and Approved

Ralph A. Butler, P.E.
Director

Enc.

xc: Mr. Alexander Adams, Jr., US NRC
Mr. Craig Bassett, US NRC Region II

Diane Purcell

DIANE PURCELL
Notary Public - State of Missouri
County of Boone
My Commission Expires Jan. 31, 2006

ATTACHMENT 1

Changes and Justifications to the Emergency Plan for the University of Missouri Research Reactor Facility

Section 1.0, first paragraph; page 1

Change last sentence:

From:
"The MURR has its own Materials License No. 24-00513-39, which among other uses, controls experiments in the Alpha Laboratory."

To:
"Additionally, the MURR has a Byproduct Materials License, No. 24-00513-39."

Justification for the change:
MURR no longer has an Alpha Laboratory; therefore, Broad Scope Materials License No. 24-00513-39 no longer regulates experiments in the Alpha Laboratory. A renewal of this License, effective December 22, 2003, included a reduction in the possession limit for isotopes associated with the TRUMP-S project; the experiment conducted in the Alpha Laboratory. As a result of this reduction, no maximum possession limit found in the current License exceeds the 10 CFR 30.72, Schedule C quantities that require consideration of the need for an Emergency Plan.

Section 1.0, last paragraph, page 3

Delete last sentence, which states:

"Revisions of the plan have been made to accommodate criteria specific to Materials License Emergency Response as required by NRC Memoranda and Orders CLI-95-01 (Feb. 28, 1995); CLI-95-08 (June 22, 1995); and CLI-95-11 (Aug. 22, 1995)."

Justification for the change:
We believe NRC Memoranda and Orders are no longer required since termination of the TRUMP-S project. Additionally, see justification for Section 1.0, first paragraph, page 1.

Section 3.1, first paragraph, page 8

Change first sentence:

From:
"MURR's EPZ is based on ANS 15.16 (Table II) as modified by the NRC evaluation of a worst-case TRUMP-S materials accident in Memorandum & Order CLI-95-01 dated Feb. 28, 1995."

To:
"The radius of MURR's EPZ is greater than the value listed in Table 2 of ANSI/ANS 15.16 for research reactors authorized to operate at a power level of 10 MW."

Justification for the change:
We believe that the modified EPZ based on the worst case TRUMP-S materials accident is no longer required since termination of the TRUMP-S project. See justification for Section 1.0, first paragraph, page 1. However, MURR prefers to use an EPZ of 150 meters instead of 100 meters as listed in Table 2 of ANSI/ANS 15.16.

Section 3.2, item 3, page 9

Delete the following words:

"not involving TRUMP-S materials (americium, neptunium, plutonium)"

Justification for the change:
See justification for Section 1.0, first paragraph, page1.

Section 3.3, item 4, page 10

Delete item 4, which reads:

"Significant releases of radioactive material as a result of fire involving TRUMP-S materials (americium, neptunium, plutonium)."

Justification for the change:
See justification for Section 1.0, first paragraph, page1.

Definition 9.23, page 24

Delete entire definition.

Justification for the change:
See justification for Section 1.0, first paragraph, page 1.

Definition 9.24, page 24

Renumber to 9.23.

Table I, page 25

Delete the following words from action level number 5:

"that does not involve TRUMP-S materials (americium, neptunium, plutonium)."

Justification for the change:
See justification for Section 1.0, first paragraph, page 1.

Table I, page 26

Delete action level number 5 (and renumber 6 to 5):

"Fire in which up to 3 grams of TRUMP-S materials (americium, neptunium, plutonium) are involved."

Justification for the change:
See justification for Section 1.0, first paragraph, page 1.

Table I, page 27

Delete action level number 4 (and renumber 5 to 4):

"Fire in which more than 3 grams of TRUMP-S materials (americium, neptunium, plutonium) are involved."

Justification for the change:
See justification for Section 1.0, first paragraph, page 1.

ATTACHMENT 2

Revised Pages to the Emergency Plan for the University of Missouri Research Reactor Facility

LIST OF EFFECTIVE PAGES

Page Number	Date Revised
Title Page/Assignment Sheet	12/8/89
Table of Contents: ii	Original *
List of Effective Pages: iii	1/14/00
1	X
2	12/20/95
3	X
4	3/18/04
5	2/20/87
6	3/18/04
7	3/18/04
8	X
9	X
10	X
11	1/14/00
12	9/18/91
13	3/18/04
14	3/18/04
15	3/18/04
16	3/18/04
17	3/18/04
18	3/18/04
19	3/18/04
20	3/18/04
21	12/28/93
22	3/18/04
23	3/18/04
24	X
25	X
26	X
27	X
Appendix A (title page)	Original
A-1	3/18/04 **
Appendix B (title page)	Original
B-1	3/18/04
B-2	3/18/04

* Original pages as written in the August 12, 1982, submittal to the NRC; these pages have no revision dates on them.

** Date updated Agreement Letter (dated 5/19/03) distributed.

EMERGENCY PLAN

UNIVERSITY OF MISSOURI RESEARCH REACTOR

1.0 INTRODUCTION

This emergency plan applies to the University of Missouri Research Reactor Facility (MURR). MURR is licensed pursuant to Title 10 Code of Federal Regulations, Chapter 1, Part 50, as a research and utilization reactor (class 104), Facility Operating License No. R-103, (Docket No. 50-186). Additionally, the MURR has a Byproduct Materials License, No. 24-00513-39.

MURR is a 10 MW pressurized water moderated pool type reactor with the reactor located in a containment building. It is located on a University of Missouri owned low population density 550-acre tract of land in Columbia, Missouri (Figure I). MURR provides research, education and service to the four campuses of the University of Missouri, other universities, government, and industry.

The plan contains a description of the elements of advance planning to cope with emergency situations connected with the operation of MURR and the conduct of experiments at MURR. The plan focuses primarily on handling of situations that may cause or may threaten to cause radiological hazards affecting the health and safety of University of Missouri staff or the public. It outlines the objectives to be met by the emergency procedures and defines the authority and responsibilities to achieve these objectives. Unusual or

unanticipated conditions in an emergency may prevent carrying out certain actions described in this plan or may require different types of actions than those described.

Many terms that are unique to MURR or that have particular connotations in the context of this emergency plan are defined in Section 9.

This plan was written to conform with 10CFR50, Appendix E, following the guidance provided by Revision I to Regulatory Guide 2.6 (for comment) Emergency Planing for Research and Test Reactors, March 1982, and ANSI/ANS-15.16, Emergency Planning for Research Reactors draft II, November 29, 1981.

3.0 CLASSIFICATION OF EMERGENCY CONDITIONS

3.1 Bases for Emergency Classifications

The radius of MURR's EPZ is greater than the value listed in Table 2 of ANSI/ANS 15.16 for research reactors authorized to operate at a power level of 10 MW. It is the area bounded by a 150 meter radius from the MURR exhaust stack which lies completely within the site boundary. There are no credible accidents identified for the MURR facility that would result in radiological effluents exceeding PAG at EPZ boundary or exceeding Alert action levels listed in Table I at the site boundary.

However, the emergency plan describes three standardized classes of emergency situations grouping the accidents according to the severity of off-site radiological consequences: (1) Notification of Unusual Events, (2) Alert; and (3) Site Area Emergency. The latter classification is included to be conservative and to provide for consultation with off-site authorities and handling of information for the public through off-site authorities.

MURR recognizes emergencies of lesser consequences than the Notification of Unusual Events classification. These include physical occurrences within the facility requiring Facility Emergency Organization response. The initial assessment should indicate that it is unlikely that an off-site hazard will be created. Protective evacuations or isolations of certain areas within the facility may be necessary.

Response to these emergencies of lesser consequence than the Notification of Unusual Events classification are detailed in MURR Standard Operating Procedures. They are based on the recognition of immediate need for on-site staff to implement emergency measures to provide aid to affected persons or to mitigate the consequences of damage to equipment; coupled with assessing radiological monitors to determine if the possibility of a more serious emergency is present. Procedures will be written for other identifiable emergencies as the need is recognized.

3.2 Notification of Unusual Events

A Notification of Unusual Events condition may exist as a result of either man-made events or natural phenomena that can be recognized as creating a hazard potential that was previously nonexistent. There is usually time available to take precautionary and corrective steps to prevent the escalation of an accident or to reduce the consequences should it occur. No releases of radioactive material requiring off-site responses are expected. Although the situation may not have caused damage to the reactor, it may warrant the immediate shutdown of the reactor or the interruption of non-essential routine functions.

Situations that may lead to this class include:

1. Threats to or breaches of security, such as bomb threats or civil disturbances directed toward the reactor.
2. Several natural phenomena such as earthquakes, tornadoes, etc.
3. Facility emergencies, such as prolonged fires or significant fuel damage indicated by high coolant fission product activity.

3.3 Alert

An Alert condition may exist when an accident within the MURR facility requires notification and response of the emergency organization to a serious radiological hazard. Substantial modification of reactor operating status is a high probable corrective action. Protective evacuations of all public and non-emergency personnel to outside the EPZ shall be performed. Isolation of certain areas within the site boundary will be necessary. Situations that may lead to this class include:

1. A fuel handling accident outside the core which releases significant radioactive materials to containment.
2. Significant releases of radioactive materials as a result of experiment failures.

3.3 Alert - Cont'd

3. Severe failure of fuel cladding or of fueled experiments when primary and containment boundaries exist to reduce releases.

3.4 Site Area Emergency

A Site Area Emergency condition may exist when events such as major damage to fuel has occurred with actual or imminent failure of primary system integrity and containment integrity. Monitoring at the site boundary should be conducted to assess the need for off-site protective actions. Protective evacuations to beyond the nearest site boundary (400 m) shall be performed.

9.19 Site Boundary

The site boundary is that boundary listed in the on-site definition, not having restrictive barriers, surrounding the operations boundary wherein the reactor administrator may directly initiate emergency activities. The area within the site boundary may be frequented by people unacquainted with the reactor operations.

9.20 Shall, Should and May

The word "shall" is used to denote a requirement; the word "should" to denote a recommendation; and the work "may" to denote permission, neither a requirement nor a recommendation.

9.21 Standard Operating Procedures (SOP)

There are Standard Operating Procedures for Reactor Operations and Health Physics which contain detailed procedures for carrying out their respective responsibilities in handling routine and emergency events.

9.22 Surveillance Team

The person or person appointed by the Emergency Coordinator to ensure that all personnel have evacuated the facility or a specific part of the facility. In the event of a Reactor Isolation or Facility Evacuation, the Duty Operators will perform the surveillance team function while evacuating the containment building.

9.23 UMHC – University of Missouri Hospitals and Clinics

The closest hospital to the facility, located within a five minute drive from MURR.

TABLE I

EMERGENCY CLASSES

Emergency Class	Action Levels	Purpose
Notification of Unusual Events	1) Report of observation of severe natural phenomenon. 2) Threats to or breaches of security 3) Concentration of airborne radioactivity at the stack monitor exceeding 20,000 AEC* averaged over 24 hours 4) The projected concentration of airborne radiological effluents at the distance corresponding to the nearest site boundary exceeding 15 mrem whole body accumulated in 24 hours. 5) Prolonged fire or explosion within the facility. 6) Other plant conditions exist that warrant assuring emergency personnel are available to respond to an emergency to prevent exposures of 1 rem whole body or 5 rem thyroid to the public or staff.	1) To assure the first step in any response later found to be necessary has been carried out; 2) bring operating staff handling of unusual events information. 3) provide systematic handling of unusual events information

* AEC-Air Effluent Concentration, 10CFR20, Appendix B, Table 2, Column 1.

TABLE I (Cont'd)

EMERGENCY CLASSES

Emergency Class	Action Levels	Purpose
Alert	1) Concentration of airborne radioactivity at the stack monitor exceeding 100,000 AEC* averaged over 24 hours.	1) Assure that emergency organization is ready to respond if situation becomes more serious;
	2) The projected concentration of airborne radiological effluent at the distance corresponding to the nearest site boundary exceeding 75 mrem whole body accumulated in 24hours	2) to perform confirmatory radiation monitoring;
	3) Radiation levels at the Distance corresponding to the nearest site boundary of 20 mren/hr for 1 hour whole body or 100 mrem thyroid dose.	3) provide communications link to offsite authority.
	4) Loss of physical control of the facility.	
	5) Other plant conditions exist with a level of significance of a major failure of fuel cladding but primary and containment boundaries exist to reduce releases.	

* AEC-Air Effluent Concentration, 10CFR20, Appendix B, Table 2, Column 1.

TABLE I (Cont'd)

EMERGENCY CLASSES

Emergency Class	Action Levels	Purpose
Site Area Emergency	1) Concentration of airborne radioactivity at the stack monitor exceeding 500,000 AEC* averaged over 24 hours. 2) The projected concentration Of airborne radiological effluent at the distance corresponding to the nearest site boundary exceeding 375 mrem whole body accumulated in 24 hours 3) Radiation levels at the distance corresponding to the nearest site boundary of 100 mrem/hr for 1 hour whole-body of 500 mem thyroid dose. 4) Other plant conditions exist with a level of significance of a major fuel damage and conditions that indicate actual or imminent failure of containment integrity and primary system integrity.	1) Assure emergency organization manned; 2) assure monitoring teams dispatched; 3) provide communication with offsite authorities; 4) provide information to the public through offsite authorities.

* AEC-Air Effluent Concentration, 10CFR20, Appendix B, Table 2, Column 1.