

UMKC RADIATION SAFETY MANUAL

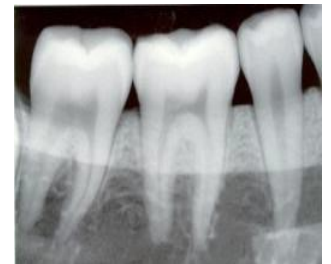
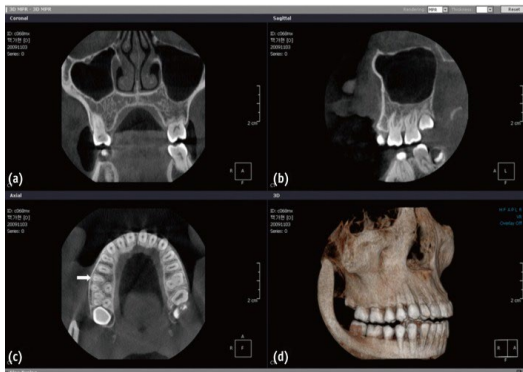
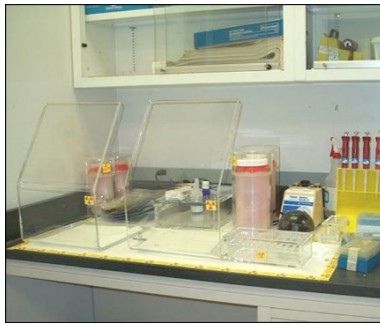
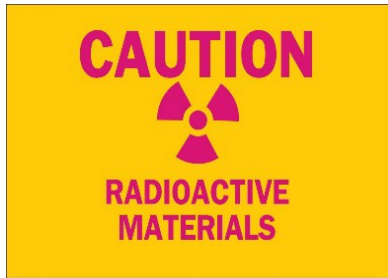


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Chapter 1 Radiation Safety Program

1.1 Introduction

The Radiation Safety Manual describes UMKC's management of ionizing radiation and establishes procedures related to radiation safety. The program and procedures described in this manual are intended to facilitate compliance with the UMKC radioactive material license and applicable state and federal regulations. A copy of the radioactive material license and relevant regulations are available for review at Environment Health and Safety (EH&S).

1.2 Radiation Producing Devices (RPD)

The use of radiation-producing devices is regulated by the State of Missouri. The State Department of Health and Senior Services Bureau of Diagnostic Services Radiation Control Program is responsible for the promulgation and enforcement of rules concerning the inspection of machine-produced radiation such as diagnostic and therapeutic X-ray machines, analytical X-ray units, electron microscopes, and particle accelerators. State of Missouri Radiation Regulations can be found at <https://health.mo.gov/safety/radprotection/>.

1.3 Radioactive Materials (RAM)

UMKC possesses an academic license issued by the U.S. Nuclear regulatory Commission (NRC) (<http://www.nrc.gov>) to the Curators. The license allows UMKC to receive, possess, use and transfer radioactive materials, with the exception of some naturally occurring radioactive materials that are exempt from regulation. The use of radioactive materials is regulated by the NRC.

Chapter 2. Authorization for Use of Ionizing Radiation Sources

2.1 Application Procedures

In order to receive authorization for use of radioactive material or radiation producing devices, the authorized user (principal investigator) must complete a RadSafe 1A RAM Application or 1B RPD Application. All forms can be obtained using the Radiation Safety website. The application must contain the following information:

- Principal investigator information.
- All personnel requesting approval to use radioactive material or radiation-producing devices must be listed.
- All proposed use areas for radioactive materials or radiation-producing devices must be listed. This includes "common" areas that may be shared with other investigators such as counting rooms.
- Each isotope and compound requested must be listed with appropriate experimental, order, and storage limits. Each radiation-producing device must be listed.

- A complete description of the experimental protocol and procedures must be submitted for evaluation by the Radiation Safety Committee. A reprint of a journal article will suffice in most cases. Failure to provide complete information may delay consideration and approval of the application.
- Indicate precautions and practices to be implemented to assure contamination control and security of radioactive material. For use of high-energy beta emitters and gamma emitters, a survey meter with an end window G-M probe will be required.
- The RSO will review the application documents for completeness and then send them to the NRC for approval.

Chapter 3: Specific Policy Statements

UMKC Unsecured Radioactive Materials Laboratory Policy

- If unattended radioactive materials are found in a laboratory, the laboratory will be closed and locked upon exiting. A verbal notice of the occurrence will be given to the AU via voice mail which will state the date and time of the unsecured laboratory observation.
- If the same radioactive materials laboratory is open and unattended a second time during the term of the Authorized User's authorization (three years), a written notice will be given to the Authorized User which will again state the date and time of the unsecured laboratory observation. The laboratory will be closed and locked upon exiting. A copy of the written notice will be sent to the Authorized User's supervisor.
- If there is a third observance of an unsecured laboratory after the written notice, the radioactive materials shall be removed from the laboratory by the Radiation Safety Officer and held for retrieval by the Authorized User. Written notice of the action taken will be left at the time of the radioactive materials removal. Procedures for regaining possession of the material will be outlined in the written notice. A copy of this written notice will be sent to the Authorized User's supervisor.
- If another occurrence of an unsecured laboratory is observed during the term of the authorization, the Radiation Safety Committee or the RSO may impose sanctions upon the Authorized User, which may include probation for a time not to exceed one month, during which radioactive materials may not be obtained or used. Further occurrences may result in permanent termination of the authorization to use radioactive materials at UMKC.
- A report of unsecured laboratories will be made to the Radiation Safety Committee. The Committee may request that the Authorized User present a plan to the Committee, in person or in writing, to ensure the security of radioactive materials in the laboratory.

UMKC Declaration of Pregnancy Policy

- Authorized users and radiation workers will be informed of this policy at site-specific orientation lectures and at retraining sessions.
- Pregnant radiation workers have the option of declaring their pregnancy. To do so, the radiation worker must contact the Office of Radiation Safety and fill out a Declaration of Pregnancy Form.
- Upon completion of the form, a review of the past exposure history and current working procedures will be conducted with the radiation worker by the Radiation Safety Officer.
- Any decision made requiring modifications of work procedures or assignments on the basis of health and safety concerns will be reviewed by the RSO.
- If it is determined that the radiation worker can continue to work safely without exceeding the limits for fetal exposure in 10 CFR 20 and NRC Regulatory Guide 8.13, Instructions Concerning Prenatal Radiation Exposure, the laboratory supervisor may require the radiation worker to continue to work with radioactive materials, or other radiation sources.
- At any time during the pregnancy, the radiation worker has the option of undeclaring the pregnancy. At that time, the exposure limits become the same as for any radiation worker.

UMKC Radiation Producing Device Policy

In order to ensure compliance with State of Missouri Radiation Protection regulations addressing registration of radiation producing devices, (*10 CSR 20-10.030*), Environmental Health and Safety (EHS) shall maintain the registration for radiation producing devices used on UMKC property. EHS shall also provide monitoring as required by the specific device and use for UMKC employees. EHS shall be contacted prior to installation, transfer and disposal of the equipment. See Appendix C

The Radiation Safety Committee shall periodically review and approve all uses of radiation sources, including radiation-producing device usage on campus.

Chapter 4: Responsibilities of the Authorized User

The authorized user is responsible for all activities conducted under the scope of that authorization. These responsibilities include ensuring that:

1. All individuals are authorized, appropriately trained, and receive proper supervision for work with radioactive materials or radiation-producing devices.
2. All activities are conducted within the scope of the authorization and any representations made to the Radiation Safety Committee or its designee.
3. All rules, regulations, and procedures for the safe use of radioactive material and radiation-producing devices are followed.
4. Accurate records regarding the amounts, types, and locations of radioactive materials and radiation-producing devices are maintained.
5. Radiological and Environmental Management has approved any changes in use or location of radioactive material or radiation-producing devices prior to implementation of such changes.

6. Ensure that documented lab surveys are performed at the required frequency
 - A. Monthly - if material is used at all
 - B. Weekly - if greater than 1 mCi is used
 - C. Daily - if greater than 5 mCi is used

7. Radiation producing devices – RPD User and EHS responsibilities:

UMKC RPD User Responsibilities	UMKC EHS Responsibilities
Notify EHS RSO of planned purchase or transfer of RPD. Provide information on vendor, use, location, workload and other RPD specifications.	New equipment or transfer – coordinate vendor registration if needed, installation, shielding and Qualified Expert (QE) inspection. Ensure documentation is provided to MRCP.
Use safe radiation procedures, PPE and dosimetry if assigned. Submit RadSafe 6 Worker Dosimetry form if dosimetry is required.	Amend RPD registration, place UMCK inventory tag on RPD, evaluate and assign dosimetry if needed.
Notifies EHS of changes in status of RPD.	Schedules periodic QE inspections, maintains registration, and inventory.
Notify EHS of pending disposal to ensure compliance with MRCP regulations.	Notify MRCP in writing of disposal within 30 days of any changes. Follows MRCP guidance on disposal of RPDs.

Chapter 5: Procurement of Radioactive Material

UMKC is required to control the acquisition of radioactive material and maintain an accurate inventory. All radioactive materials must be approved by the RSO. The RSO will verify that the amount requested, and the isotope are within the limits of the authorized users permit

5.1 Ordering Radioactive Material

Each laboratory is responsible for ordering radioactive materials. The Radiation Safety Officer will not place orders for radioactive materials. Each laboratory follows the procedures for their Department or School. Purchases of radioactive materials are approved through Radiation Safety, but the Authorized User/Permit Holder is responsible for ensuring that radioactive materials are properly ordered.

Radiation Safety approves and accepts all shipments of radioactive materials that are delivered to UMKC. This includes shipments purchased and any replacement or other types of “free” shipment of radioactive materials. There are two methods of approval for the purchase of radioactive materials.

1. Approval of single or blanket order purchase requisition(s).
2. Approval of credit card purchases.

The Radiation Safety Officer shall be informed of ALL packages of radioactive material that are

expected to arrive at UMKC prior to the packages being shipped. This includes complimentary, replacement or collaborative shipments from other institutions.

Once an approved AU has placed an order for radioactive materials, notify the Radiation Safety Officer and provide the following information:

- Isotope
- Activity
- Chemical form
- Company name
- Expected Delivery Date
- Tracking number if applicable

There are addresses for the delivery of radioactive material. The correct delivery address is based upon the physical location of the laboratory in which the radioactive material will be used.

For Hospital Hill locations, (Medical School, Dental School, or Health Science Building) contact the Radiation Safety Officer prior to ordering radioactive material

For the Volker Campus, the delivery address is:

UMKC Environmental Health & Safety
General Services Building
Radiation Safety Officer, Room 015D
1011E51st Street
Kansas City, MO 64110

5.2 Receipt of Radioactive Material

All radioactive materials received at UMKC must be delivered to the RSO office unless prior arrangements have been made. Materials received will be processed to check for proper isotope and form, exposure rate, and any gross contamination. Inner vials are not surveyed for contamination; therefore, these containers should be handled as if they were contaminated. After processing, the material is delivered to the laboratory. Upon receipt, the user is responsible for maintaining accurate inventory records for all radioactive material possessed.

Chapter 6: Transfer of Radioactive Material

The transfer of radioactive material to another project or licensee (other than properly disposed waste) must be approved by the RSO prior to transfer of the material. Transport of radioactive or hazardous material must be in compliance with all DOT regulations. Contact the RSO for information on transportation regulations.

6.1 On-Campus Transfer

Transfer of radioactive material to another user will usually be approved if the receiving individual has authorization to possess that type and amount of radioactive material. A RadSafe Form 17 Internal Transfer Request or a memo stating the persons, isotope, form, and amount involved in the transfer must be submitted when the transfer takes place.

6.2 Off-Campus Transfer

Current regulations allow the transfer of radioactive material to holders of current licenses with the Nuclear Regulatory Commission or an agreement state. Prior to transfer, UMKC must have written verification that the facility holds a valid license to possess radioactive material. The RSO will ship material upon request to ensure that proper packaging and labeling requirements are met. Any transfer to UMKC from a non-vendor source (gift, joint research) will be handled in the same manner as that from a vendor source. The material must be shipped to the RSO and the Authorized User will be notified upon receipt.

Chapter 7: Radioactive Waste Handling

The Radiation Safety Officer is responsible for collection, management, and disposal of all radioactive waste at UMKC. The disposal of radioactive material via the sanitary sewer or regular trash receptacles is prohibited. Some general points to follow are outlined below:

- Radioactive waste (both solid and liquid) must be segregated according to half-life. Short half-life material (less than 30 days) such as ^{32}P must be separate from ^3H , ^{14}C , and ^{35}S .
- Solid waste (other than short half-life) must be separated according to its combustibility. Paper, cardboard and plastics are incinerated while metal and glass are compacted and shipped for disposal. Sharp items such as needles, razor blades, and Pasteur pipettes must be placed in a box or a "sharps" container to prevent injury during subsequent handling of the waste. Lead containers must be segregated from other solid waste.
- Liquid organic waste and aqueous waste must be collected separately. Scintillation media in vials should be placed in the original carton or packed to prevent leakage of the liquid in transport.
- Radioactive animal carcasses, viscera, or other biological materials subject to putrefaction must be placed in a plastic bag and frozen prior to pickup.
- If possible, the mixing of hazardous chemicals and radioactive materials should be avoided. So called "mixed waste" which contains radioactivity and a component which exhibits corrosivity, reactivity, toxicity, etc. can have significant handling and disposal problems. If these materials must be mixed together, contact the Radiation Safety Officer and the Hazardous Waste Manager for assistance in developing procedures to minimize the generation of this type of waste.

All radioactive waste must be properly labeled with the isotope, activity, and date sealed. Under no circumstances will waste be picked up if the label is not complete. For assistance concerning unique situations, contact the Radiation Safety Officer. All containers (i.e. bags, carboys, etc.) are supplied by the Radiation Safety Officer.

Submit completed RadSafe Form 18 RAM Waste Pickup forms to the RSO.

Chapter 8: Personnel Exposure and Monitoring

The personnel monitoring program at UKKC is designed to keep exposures to ionizing radiation "As Low As Reasonably Achievable" (ALARA). To this end, all personnel with the potential for receiving significant exposure from X-ray, gamma, high-energy beta, and neutron radiation are required to wear appropriate dosimeters. Dosimeters are provided at no cost to the individual. The individual, however, is responsible for prompt return of the dosimeters at the end of each wear date, even if the dosimeter was not worn during that period.

8.1 Occupational Exposure Limits

The annual limit for occupational workers is the more limiting of:

- The total effective dose equivalent = 5,000 millirem (0.05 Sv); or
- The sum of the deep dose equivalent and the committed dose equivalent to any individual organ or tissue (other than the lens of the eye) = 50,000 millirem (0.5 Sv).

The annual limits to the lens of the eye, to the skin, and to the extremities are:

- Eye dose equivalent = 15,000 millirem (0.15 Sv)
- A shallow dose equivalent = 50,000 millirem (0.5 Sv)

8.2 Declared Pregnant Workers Exposure Limits

The increased sensitivity of rapidly dividing cells makes the human embryo and fetus more susceptible to injury from exposure to ionizing radiation. For this reason, the National Council on Radiation Protection and Measurements (NCRP) recommends and NRC regulations require that exposure to the worker (fetus) during the gestation period not exceed 500 millirem (one-tenth of the occupational limit) . A declared pregnant woman means a woman who has voluntarily informed her employer in writing of her pregnancy and the estimated date of conception. If a declaration is made, it must be given to the Radiation Safety Officer (RSO) in writing or a completed RadSafe 7 Pregnancy Declaration form. Once the declaration is made, her occupational dose limit will be lowered to 500 millirem (0.5 mSv), and she will receive a fetal dosimeter. Regulatory Guide 8.13, published by the Nuclear Regulatory Commission, outlines health risk estimates associated with radiation exposure and means to reduce risks. A PDF copy can be found at <https://www.nrc.gov/docs/ML0037/ML003739505.pdf>.

8.3 Non-occupational Exposure

Each user of radioactive material shall conduct operations so that the dose in any unrestricted area from external sources does not exceed 2 millirem (0.02 mSv) in an hour.

8.4 Personnel Radiation Dosimetry

External exposure to gamma, X-ray, high-energy beta, and neutron radiation is monitored by

devices called dosimeters. At UMKC optically stimulated luminescence (OSL) and thermoluminescent dosimeters (TLDs) are used to measure whole-body exposure. Ring dosimeters are used to measure exposure to the extremities. Wrist dosimeters are issued instead of ring dosimeters when it is necessary to monitor extremity exposure from thermal and fast neutron radiation. To provide accurate estimates of radiation exposure, the dosimeter must be worn properly when working with radioactive materials or radiation-producing devices. A whole-body dosimeter should be worn on the collar, pocket, or belt area. If a lead apron is worn and only one whole-body dosimeter is provided, the dosimeter should be worn outside the apron. If a lead apron is worn and two whole-body dosimeters are provided, one dosimeter should be worn on the collar, and the other should be worn under the lead apron. The ring dosimeter should be worn with the sensitive area (label) on the palm side of the hand. Fetal dosimeters should be worn on the abdominal area.

Only individuals using certain radioisotopes and amounts are provided with dosimetry. If a whole-body and/or ring dosimeter is required, it will be provided at the time of the initial work period. The guidelines for issuing dosimetry are as follows:

- Low-energy beta emitters (e.g. ^3H , ^{14}C , ^{35}S , ^{45}Ca)
 - No dosimetry required
- High-energy beta emitters (e.g. ^{32}P , ^{90}Sr)
 - Ring dosimeters issued for 1 mCi or greater
 - Whole-body dosimeter issued for 5 mCi or greater
- Low-energy gamma emitters (e.g. ^{51}Cr , ^{57}Co , ^{125}I)
 - Ring dosimeter issued for 1 mCi or greater
 - Whole-body dosimeters issued for 5 mCi or greater
- High-energy gamma emitters (e.g. ^{22}Na , ^{60}Co , ^{137}Cs , ^{131}I)
 - Ring dosimeter issued for 0.1 mCi or greater
 - Whole-body dosimeter issued for 1 mCi or greater
- Neutron emitters (e.g. neutron generators, ^{252}Cf)
 - Extremity dosimeter issued for 10 mCi
 - Whole-body dosimeter issued for any use

8.5 Exposure Limits for Minors

The annual occupational dose limits for minors is 10 percent of the annual occupational limits specified for adult workers in Section 8.1 of this manual

8.6 ALARA (As Low As Reasonably Achievable)

UMKC is committed to maintaining radiation exposures to faculty, staff, students, and the public resulting from the use of radiation sources in teaching and research As Low As Reasonably

Achievable (ALARA). The Radiation Safety Committee and RSO assist faculty, staff, and students in all matters regarding radiation safety.

Chapter 9: Laboratory Safety

Although the potential hazards of working with radioactive materials may be significant, proper facilities and the observance of laboratory safety rules can keep risks to a minimum.

9.1 Facilities

In general, a properly designed laboratory will be adequate to serve the needs of radioisotope users. Specific research may require the use of specially designed facilities to minimize the hazards associated with that particular research. Procedures that differ significantly from those approved in the past must be approved by the Nuclear Regulatory Commission.

As a minimum, radioisotope laboratories should have the following features.

- Smooth, non-porous floors and walls that can easily be cleaned in the event of spills or contamination.
- Smooth non-porous lab benches that can easily be decontaminated. Porous surfaces must be covered with absorbent paper or the work must be done in an appropriate spill tray.
- When required, laboratory fume hoods and ventilation systems must be of the appropriate design and construction for the hazard.
- The facility should be easily isolated from general personnel access areas such as hallways and office areas. The areas should have locks, or some means to prevent access and unauthorized use of radioactive materials when personnel are not in attendance.
- Appropriate shielding and/or interlocks to prevent personnel access must be used when radiation levels would present undue hazards to personnel or the general public. (Note that exposure rates greater than 5 mR/hr. require posting as a "radiation area" and levels in unrestricted areas cannot exceed 2 mR/hr.).

9.2 Procedures and Rules for Safe Use of Radioactive Material

- Eating, drinking, food preparation, food storage, and application of cosmetics are not permitted in laboratories where radioactive materials are stored or used. Most radioisotope laboratories are also chemical laboratories subject to the Purdue Chemical Hygiene Plan. Under these guidelines, drinking, eating, and the application of cosmetics are also forbidden in areas where hazardous chemicals are in use.
- The use of food containers for handling or storing radioactive materials is not permitted. Any other containers used must be clearly marked as containing radioactive material.
- The pipetting of radioactive solutions by mouth is strictly prohibited.
- A trial run without radioactive material must be conducted for all new procedures.

Radioactive material may be used only after the safety of the procedures has been assured.

- Any work performed with volatile material (such as sodium iodide) or operations that have a potential for personnel exposure or contamination must be performed in an appropriate hood or glove box. New procedures involving these types of materials must be approved by the Nuclear Regulatory Commission prior to initiation.
- Protective equipment such as gloves and lab coats must be used for all manipulations of unsealed sources. In addition, eye protection must be worn when working with materials that could be hazardous to the eyes. Eye protection is also required when handling greater than 10 millicuries of high-energy beta emitters such as P-32 (i.e. ^{32}P).
- Protective equipment must not be worn outside the laboratory unless it has been monitored and found to be free of contamination. Gloves, while providing protection to the user, can spread contamination if worn outside the laboratory.
- Individuals should survey themselves and their work areas on an “as used” or daily basis. All work surfaces must be covered with absorbent paper that is changed as needed. Work with large volumes of material and/or material with high spill possibility, must be done in an appropriate spill tray.
- A radiation survey should be performed by the radionuclide user at the end of each procedure involving radioactive materials. The survey may be conducted with a portable survey instrument or wipes as appropriate. All items found to be contaminated must be placed in a suitable area or disposed of as radioactive waste. Any detected radioactive contamination must not be allowed to remain in any area for an extended period of time. Radiological contamination can be removed from non-porous surfaces by using common household cleaners. If contamination is found outside the immediate use area, the RSO must be notified immediately.
- Radioactive material use, survey, and inventory records must be maintained at all times by the Authorized User.
- Any equipment that is used in experiments involving radioactive material must have the proper ‘Caution Radioactive Material’ label affixed. This label may only be removed after the RSO has certified that it is free of radiological contamination.

9.3 Inspections and Postings

Radioisotope laboratories are classified and inspected according to their relative hazard. This classification takes into account the radioisotope, amount used and stored, chemical form, and types of procedures performed in the laboratory. The classification scheme and inspection frequency is listed below in Table 3.

Table 3 – Laboratory Inspection Scheduled (by Hazard)

Lab Class	Schedule
Class A (High)	Weekly

Class B (Moderate)	Monthly
Class C (Low)	Quarterly
Class D (Very Low)	Yearly

The purpose of the inspections and laboratory audits conducted the RSO is to verify that activities at UMKC are conducted within the scope of the NRC license, applicable state and federal regulations and conditions approved by the Radiation Safety Committee. These inspections do not take the place of routine surveys conducted by laboratory personnel or waive the requirement to maintain records.

All laboratory areas must be posted with a "Caution-Radioactive Materials" sign and an NRC Form 3 <https://www.nrc.gov/reading-rm/doc-collections/forms/nrc3.pdf> . These signs are posted by the RSO once an area is approved for radioactive material use. After an area is no longer needed and radioactive materials are removed, the room will be released for unrestricted use and the signs removed by the RSO.

Chapter 10: Training

Each AU is responsible for ensuring persons using radiation sources under his or her supervision receives training. Web-based training modules have been developed that give radiation safety training for new radiation source users and refresher training.

The law requires that individuals shall be instructed in the following topics before working with radioactive materials:

- Health protection problems associated with exposure to radioactive materials or radiation.
- Precautions or procedures to minimize exposure.
- Purposes and functions of protective devices employed.
- Employee responsibility to promptly report any condition that may lead to or cause a violation of the regulations or cause an unnecessary exposure.
- Actions to take in the event of an emergency.

The extent of the instruction shall be commensurate with the potential radiological health problems in the work area.

Records of this instruction must be maintained by the RSO.

Chapter 11: Emergency Procedures

Emergencies resulting from accidents in radioisotope laboratories may occur even though all laboratory rules are obeyed. Because of numerous complicating factors, set rules of emergency procedures cannot be made to cover all possible situations. In any situation, the primary concern is protection of personnel from physical and radiation hazards. The secondary concern is confinement of any contamination to the immediate area.

10.1 Minor Accidents/Spills

Accidents involving small quantities of radioactive material in non-volatile form confined to a small area can usually be regarded as minor.

1. Notify all other persons in the room at once.
2. Exclude persons not directly involved in the dealing with the spill.
3. Confine the spill immediately.
 - A. Liquids: Drop absorbent paper or material on spill.
 - B. Solids: Dampen thoroughly using small quantities of water, taking care not to spread contamination. Use water unless it would generate an air contaminant. Oil should then be used.
4. Notify the laboratory supervisor and the Radiation Safety Officer (816) 235-6096.

10.2 Major Accidents/Spills

Accidents occurring outside a hood involving volatile material or accidents involving large (millicurie) amounts should be considered major. Discovery of any widespread contamination should also be considered major.

1. Notify all persons in the room and take steps to evacuate the area.
2. Rinse off skin by flushing with water and remove contaminated clothing if applicable.
3. Secure the room and prohibit entry to the contaminated area.
4. Immediately notify the laboratory supervisor and the Radiation Safety Officer (816) 236-6096. During off hours or if the RSO cannot be reached, contact the University Police at (816) 235-1515.
5. Assemble those persons involved near the laboratory entrance and wait for assistance.

10.3 Injury

For any accident in which a person requires medical attention, the first priority for other laboratory personnel is to assist that individual in getting such attention. This may involve administering first aid and/or calling for emergency medical assistance. Once this has been accomplished, the previously described contamination control procedures should be followed as appropriate.

Appendix A Delegation of Authority

The Board of Curators of the University of Missouri has responsibility for management of the University of Missouri, including operations at the University of Missouri Kansas City (UMKC) campuses. The President of the University System has been delegated the executive responsibility and authority for administration of operations.

Chancellor

The President delegates to the Campus Chancellors the responsibility and authority for execution of operations conducted on each of the four campuses.

All Licenses are issued to “The Curators of the University of Missouri.” UMKC’s USNRC license is issued to “The Curators of the University of Missouri, The Chancellor.” The Chancellor is responsible for providing adequate support for the radiation safety program at UMKC. The responsibilities of the Chancellor may not be transferred to other individuals. Tasks, duties and authority to accomplish the tasks and duties may be assigned or delegated, but final responsibility for the program rests with the Chancellor.

Institutional Official

The Chancellor assigns the University’s Institutional Official (IO) the responsibility for providing adequate support for the radiation safety program at UMKC, complying with the regulations and assuring that licensed activities will be conducted safely through the Radiation Safety Committee.

The IO has the authority to delegate resources for the program and appropriate funds in a timely manner for the radiation safety program. Whenever this support is not provided adequately or if it cannot be provided, the program(s) using radiation sources will be curtailed by the Radiation Safety Committee.

Radiation Safety Committee

The UMKC Chancellor ensures adequate control over materials-licensed activities through a Radiation Safety Committee (RSC). Authority is derived from the Board of Curators and the President through the Chancellor. The RSC establishes policies related to the safe use of ionizing radiation sources at UMKC.

Committee members are appointed by the Chancellor in collaboration with the Institutional Official. The RSC membership includes the Radiation Safety Officer, a management representative, and a majority of persons trained and experienced in the safe use of radioactive materials and radiation producing devices. Because the responsibilities of the RSC include more than safe use of radioactive materials, representation from academic disciplines providing expertise in Law, Business Management and Environmental Science may also be sought.

Director of Environmental Health and Safety and Risk Management

The Chancellor has delegated to the Director of Environmental Health and Safety (“EHS”) the overall responsibility to ensure that all campus activities comply with regulatory agency requirements concerning environmental health and safety conditions at the University. This includes authorization to immediately stop activities or conditions that would constitute an urgent or serious health risk to members of the campus community or to the environment.

Radiation Safety Officer (RSO)

The Radiation Safety Officer (RSO) is an individual, qualified by training and experience in radiation protection, who is available for advice and assistance on radiation safety matters. The RSO is appointed by the Chancellor and requires approval by the Nuclear Regulatory Commission.

Appendix B RadSafe Forms List

RAM Forms		RPD Forms	
#		#	
1A	RadSafe 1A RAM Application	1B	RadSafe 1B RPD Application
2	RadSafe 2 Amendment to Permits	2B	RadSafe 2B Amendment to Registration
3	RadSafe 3 Authorization Renewal		
4	<i>RadSafe 4 reserved</i>		
5	RadSafe 5 Worker Training & Experience	5	RadSafe 5 Worker Training & Experience
6	RadSafe 6 Worker Dosimeter Request	6	RadSafe 6 Worker Dosimeter Request
7	RadSafe 7 Pregnancy Declaration	7	RadSafe 7 Pregnancy Declaration
8	RadSafe 8-Laboratory RW Orientation Checklist		
9-14	<i>RadSafe 9-14 reserved</i>		
15	RadSafe 15 RAM Receipt Form		
16	RadSafe 16 RAM Use Log		
18	RadSafe 18 RAM Waste Pickup		
19	RadSafe 19 Animal Waste Pickup		
20	RadSafe 20 Coversheet—RAM Permit		
21	<i>RadSafe 21-reserved</i>		
22	RadSafe 22 RW Observation Checklist		
23	<i>RadSafe 23 reserved</i>		
24	RadSafe 24 EHS Report of Incident Response		RadSafe 24 EHS Report of Incident Response
25	RadSafe 25 Lab Survey Report		
25a	RadSafe 25a Special Survey Report		RadSafe 26 Device Radiation Survey Data Report