

Radiation Emergency Response Plan

UNLV

Risk Management and Safety
Radiation Safety Office

Responsible Office: Risk Management & Safety
University of Nevada, Las Vegas
Las Vegas, Nevada 89154-1042
(702) 895-4226

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PREFACE

This Radiation Emergency Response Plan contains the policy, classification, and procedures for the handling of emergencies involving radioactive materials or areas where radioactive materials are stored and/or used at the University of Nevada, Las Vegas. It defines responsibilities carried by the Radiation Safety Office and its cooperation with First Responders in case of emergency.

Brian Rowsell
Radiation Safety Officer

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1.0 Purpose

Radionuclides used in research at UNLV can present hazards because of their ability to irradiate and contaminate individuals and the environment. The purpose of these procedures is to outline the basic approach to a radiological incident that will ensure that the safety and health of staff, students, public, and the environment are protected.

2.0 Policy

UNLV will respond effectively to a radiological incident to ensure that exposures to radioactive materials to members of staff and the public are kept ALARA and within regulatory limits.

3.0 Emergency Classification

Incident	Action Level	Classification
Spills of Radioactive Material: Liquids and Solids	Minor	Accident
	Major	Notification of Unusual Event *
Incidental Release of Radioactive Dusts, Mists, Fumes, and Gases	Minor	Accident
	Major	Notification of Unusual Event *
Personal Injury in Radiation Laboratory	Without Personal Contamination	Accident
	With Personal Contamination	Notification of Unusual Event *
Fire	Minor	Accident
	Major	Notification of Unusual Event *

4.0 Responsibility

Anyone, Trainer, Radiation Worker, Risk Management and Safety Department member, or Authorized User of Radioactive Materials involved in or witnessing a radiological incident has the responsibility to fulfill the requirements of this procedure in lieu of management of the area in which the incident occurred until management personnel are present on the site. After this time, it is the responsibility of the most senior manager available to implement this procedure.

For radiation contamination incidents, the Radiation Safety Officer has the responsibility for restricting or allowing access to a location where radioactive contamination is possible. The Radiation Safety Officer has the responsibility for supervision of the

In the event of accidental spillage, keep calm, use common sense, protect people, and do not spread the contamination. If high radiation levels or the possibility of airborne contamination from **volatile** or dispersal radioactive material is present, evacuate the laboratory immediately; secure the laboratory to prevent entry; notify RSO. Unnecessary movement or touching shall be avoided. Use the following as guides:

- S** **Stop**. Localize the spill. Put on disposable gloves, right the container, and blot the spill with absorbent material. Do not wipe or use wiping motions because this may spread the contamination.
- W** **Warn**. Notify persons in the area that a spill has occurred
- I** **Isolate**. Isolate the area and report the incident to the Radiation Safety Office
- M** **Minimize**. Minimize your exposure.
- S** **Survey**. Survey the area with appropriate instruments. Check the area around the spill, your hands, clothing and shoes for contamination.

7.0 Spills of Radioactive Material:

2. Prevent the spread of contamination by covering the spill with absorbent paper. (Paper should be dampened if solids are spilled.)
3. Clean up the spill, wearing disposable gloves and using absorbent paper.
4. Carefully fold the absorbent paper with the clean side out and place in a plastic bag for transfer to a radioactive waste container. Put contaminated gloves and any other contaminated disposable material in the bag.
5. Survey the area with an appropriate low-range radiation detector survey meter or other appropriate technique. Check the area around the spill for contamination. Also, check hands, clothing, and shoes for contamination.
6. Report the incident to the RSO promptly.
7. Allow no one to return to work in the area unless approved by the RSO.
8. Cooperate with the RSO and/or the Radiation Safety Office (e.g., investigation of root cause, provision of requested bioassay samples).
9. Follow the instructions of the RSO and/or the Radiation Safety Office (e.g., decontamination techniques, surveys, provision of bioassay samples, requested

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8.0 Incidental Release of Radioactive Dusts, Mists, Fumes, and Gases

Classification of an Incidental Release of Radioactive Dusts, Mists, Fumes, and Gases as a Minor or Major event will depend on the nature of the released radioactive material. The RSO will determine the classification of the release.

In general, Incidental Release of Radioactive Dusts, Mists, Fumes, and Gases in the air shall be classified as Minor Release if the amount of released radioactive activity does not exceed 100 microCuries, and a restriction for access to the contaminated area does not exceed 24 hours. If released radioactive activity is equal to or exceeds 100 microCuries or a restriction for access to the contaminated area exceeds 24 hours, the release shall be classified as a Major Release. The following procedure shall be followed in case of either Minor or Major release:

Authorized User or First Responders will:

1. Notify all personnel to vacate the room immediately.
2. Shut down ventilation system, if possible, unless it is determined that the room ventilation system needs to be used to clear the air for access purposes.
3. Seal the area, if possible.
4. **Notify the RSO immediately.**
5. Ensure that all access doors to the area are closed, locked if possible, and posted with radiation warning signs, or post trained guards at all access doors to prevent accidental opening of the doors or entry to the area.
6. Survey all persons who could have possibly been contaminated. Decontaminate as directed by the RSO.
7. Promptly report suspected inhalations and ingestions of licensed material to the RSO.
8. Decontaminate the area only when advised and/or supervised by the RSO.
9. Allow no one to return to work in the area unless approved by the RSO.
10. Cooperate with the RSO and/or the Radiation Safety Office (e.g., investigation of root cause, provision of requested bioassay samples).
11. Follow the instructions of the RSO and/or the Radiation Safety Office (e.g., decontamination techniques, surveys, provision and collection of bioassay samples, requested documentation).

RSO and/or the Radiation Safety Office will:

1. Promptly assess the situation and determine classification of the release.

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3. If the injury justifies the need for immediate medical attention, have one individual **immediately call 911 (the Police Services) and then call the RSO**, briefly describe the injury, and explain the type of accident, ask for instructions to follow.
4. Assign someone to direct the arriving First Responders and Ambulance Personnel to the incident scene and escort them to the injured person. Inform them where radioactive materials are stored and/or located as well as any precautions to avoid exposure, cross contamination or risk of creating radioactive contamination in the area.
5. Emergency Responders take charge upon arrival and proceed with assistance of RSO and/or the Radiation Safety Office if present at the time.
6. In consultation with the RSO, determine a plan of actions to survey laboratory and personnel after the incident is eliminated and there is no threat to the life and health of the injured person.
7. Allow no one to return to work in the area unless approved by the RSO and Emergency Responders.
8. Cooperate with the RSO and/or the Radiation Safety Office (e.g., provision of requested bioassay sample, investigation of root cause).
9. Follow the instructions of the RSO and/or the Radiation Safety Office (e.g., surveys, requested documentation).

RSO and/or the Radiation Safety Office will:

1. **Immediately call 911 (the Police Services)**, if not already done, briefly describe the injury and explain the type of accident.
2. Assist First Responders with facility specifications and radiation protection. Make sure they are aware where radioactive materials are stored or where radioisotopes were being used; inform them of the present location of the licensed material and the best possible entrance route to the radiological area, as well as any precautions to avoid unnecessary exposure.
3. Set up a controlled area where the laboratory personnel, First Responders, and/or Ambulance Personnel can be surveyed for contamination of their clothing and equipment if possible.
4. Once the incident is mitigated and there is no threat to the life and health of the injured person, advise the Ambulance Personnel not to enter potentially contaminated areas or areas where radioactive sources may be present.
5. If it is feasible, perform thorough contamination surveys of the First Responders and/or Ambulance Personnel and their equipment before they leave the controlled area. If it is not possible, the RSO and/or the RadiT/F1 12 Tf1 0 0 1 126.02 681.58 Tm0 g0 G(brie)

conduct a thorough contamination survey to the involved personnel and equipment.

6. Supervise decontamination activities.
7. Determine cause and needed corrective actions; consider need for bioassays if licensed material is suspected to have been ingested, inhaled, or absorbed through or injected under the skin. Document incident.
8. Notify the State of Nevada, Radiation Control Program according to the applicable provision of NAC 459.
9. After actions will include determination of the cause of the event and required corrective actions.
10. Once the immediate emergency is mitigated, advise the RSC chair of the incident and recommend appropriate corrective actions.

9.2 Personal Injury in Radiation Laboratory with Personal Contamination

In the event a person receives an injury requiring medical attention in a laboratory where radioactive materials are present, and the person is extensively contaminated, the following procedure will be initiated.

7. The treatment of a serious or life-threatening injury takes precedence over the injured person's contamination. If immediate transport is required, the injured person can be transported on a gurney and covered in a sheet.
8. Any decontamination of the ambulance, equipment and responders' turnout gear is to be addressed after the patient is transported.
9. In consultation with the RSO, determine a plan of action to survey laboratory and personnel after the incident is mitigated.
10. Allow no one to return to work in the area unless approved by the RSO and Emergency Responders.
11. Cooperate with the RSO and/or the Radiation Safety Office (e.g., investigation of root cause, provision of requested bioassay samples).
12. Follow the instructions of the RSO and/or the Radiation Safety Office (e.g., surveys, requested documentation).

RSO and/or the Radiation Safety Office will:

1. **Immediately call 911 (the Police Services)**, if not already performed, briefly describe the injury, explain the type of accident, and report that the injured person is contaminated.
2. Assist First Responders with facility specifications and radiation protection. Make sure they are aware where radioactive materials are stored or where radioisotopes were being used; inform them of the present location of the licensed material and the best possible entrance route to the radiation area, as well as any precautions to avoid unnecessary exposure.
3. The treatment of a serious or life-threatening injury takes precedence over the injured person's contamination. If immediate transport is required, the injured person can be transported on a gurney and covered in a sheet.
4. Any decontamination of the ambulance, equipment and responders' turnout gear is to be addressed after the patient is transported.
5. Set up a controlled area where laboratory personnel, First Responders, and/or Ambulance Personnel can be surveyed for contamination of their clothing and equipment.
6. Once the incident is eliminated and there is no threat to the life and health of the injured person, advise the Ambulance Personnel not to enter potentially contaminated areas or areas where radioactive sources may be present.
7. If it is feasible, perform thorough contamination surveys of the First Responders

and/or Radiation Safety Office personnel can meet the Ambulance personnel at the hospital.

- b. Upon arrival at the hospital, the Radiation Safety Office staff should assist the hospital emergency staff in patient contamination control, if requested.
 - c. Radiation Safety Office staff will conduct a thorough contamination survey of the involved personnel, equipment and facilities after their immediate assistance to the patient and attending hospital staff is no longer required. They shall remain at the hospital until any decontamination procedures are complete.
8. Consider the need for bioassays if licensed material is suspected to have been ingested, inhaled or adsorbed through or injected under the skin. Document the incident.
 9. Notify the State of Nevada, Radiation Control Program according to the applicable provision of NAC 459.
 10. After actions will include determination of the cause of the event and required corrective actions.
 11. Advise the RSC chair of the incident and recommend appropriate corrective actions.

10.0 Fire

10.1 Minor Fire

7. Decontaminate personnel by removing contaminated clothing and flushing contaminated skin with lukewarm water, then washing with a mild soap.
8. Survey the event scene to determine contamination levels.
9. In consultation with the RSO, determine a plan of decontamination and the types of protective devices and survey equipment that will be necessary to decontaminate the area.
10. Allow no one to return to work in the area unless approved by the RSO.
11. Cooperate with the RSO and/or the Radiation Safety Office (e.g. provision of requested bioassay samples, investigation of root cause).
12. Follow the instructions of the RSO and/or the Radiation Safety Office (e.g., decontamination techniques, surveys, requested documentation).

RSO and/or the Radiation Safety Office will:

1. If fire moved from Minor category to Major category, follow procedures for Major Fire.
2. Supervise decontamination activities.
3. If decontamination of personnel was not fully successful, consider inducing perspiration by covering the area with plastic. Then wash the affected area again to remove any contamination that was released by the perspiration.
4. Consult with Fire Safety personnel to assure that there is no possibility of another fire starting.
5. Consider the need for bioassays if licensed material is suspected to have been ingested, inhaled or adsorbed through or injected under the skin. Document the incident. Determine cause and needed corrective actions.
6. Notify the State of Nevada, Radiation Control Program according to the applicable provision of NAC 459.
7. Advise the RSC chair of the incident and recommend appropriate corrective actions.

2. Assign someone to direct the arriving Fire Department to the incident scene and escort them to the scene.
3. Once all persons are evacuated, isolate the area to prevent the spread of possible contamination.
4. Do not allow anyone to enter the area.
5. Survey all involved persons for possible contamination.
6. Decontaminate personnel by removing contaminated clothing and flushing contaminated skin with lukewarm water, then washing with a mild soap.
7. Upon arrival of the Fire Department, inform them where radioactive materials are

5. Perform thorough contamination surveys of the First Responders and their equipment before they leave the controlled area and decontaminate, if necessary.
6. Supervise decontamination activities.
7. If decontamination of personnel was not fully successful, consider inducing perspiration by covering the area with plastic. Then wash the affected area again

RSO and/or the Radiation Safety Office will:

1. Contact, if possible, the person who attempted to access the radiation laboratory without proper authorization.
2. Determine if the person has legitimate reason to access the laboratory and the laboratory supervisor has no objections.
3. Provide the person with proper Radiation Safety Training and instructions regarding access restrictions associated with Radiation Laboratories, if required.

11.2 Loss of control of radioactive material

If there is suspected or confirmed loss of control of radioactive materials, take the following actions:

1. Notify the RSO and/or Radiation Safety Office promptly. Request special instructions regarding securing the area.
2. Follow the instructions of the RSO and/or the Radiation Safety Office (e.g., securing area, surveys, conducting minor investigation).
3. Cooperate with the RSO and/or the Radiation Safety Office (e.g., investigation of root cause loss of the material).

RSO and/or the Radiation Safety Office will:

1. Promptly assess the situation. If threat is confirmed, the Executive Director of Risk Management and Safety Department, the Police Services, [ah79.05 381.612 Tf1 0 0 1 350.11

1. Notify all persons in the area to stop and secure their work if feasible and leave the potentially affected area immediately.
2. Notify the Police Services and briefly described the nature of the situation.
3. Notify the RSO and other Risk Management and Safety Department personnel.
4. Upon arrival of the First Responders, inform them where radioactive materials are stored or where radioisotopes were being used; inform them of the present location of the licensed material and the best possible entrance route to the radiation area, as well as any precautions to avoid exposure or risk of creating or spreading radioactive contamination.
5. Emergency Responders take charge upon arrival and proceed with assistance of RSO and/or the Radiation Safety Office.
6. Allow no one to return to work in the area unless approved by the Emergency Responders and the RSO.

RSO and/or the Radiation Safety Office will:

1. Coordinate activities with the Police Services, First Responders and/or other Risk Management and Safety Department staff.
2. Once the threat is eliminated, advise the First Responders not to enter potentially contaminated areas or areas where radioactive sources may be present until a thorough evaluation and survey are performed to determine the extent of the damage to the licensed material use and storage areas.
3. Perform thorough contamination surveys of the First Responders and their equipment before they leave the controlled area and decontaminate, if necessary.
4. Document incident.
5. Notify the State of Nevada Radiation Control Program according to the applicable provision of NAC 459.
6. Advise the RSC chair of the incident.

12.0 Major Natural Disaster

All major natural disaster such as Fires, Tornado, Flood, Explosion, Epidemic and Major Emergency require close cooperation with the Police Services. Member of the Radiation Safety Office are not First Responders. Their major function is assisting with facility specifications and radiation protection for the Police Services and/or First Responders. The following general guideline shall be followed:

1. Notify all persons in the area to stop and secure their work and leave immediately.
2. **Notify the Police Services (call 911)**

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13.0 Emergency Preparedness Program

13.1 Personnel

The Radiation Safety Office consists of the RSO, Alternate RSO, Radiation Safety Technician(s), and Student Workers trained and qualified in the disciplines appropriate for handling radioactive materials and response to emergencies involving radioactive materials.

13.2 Communication

The Radiation Safety Office has a comprehensive communication program in place that provides immediate access to the office personnel during and after working hours. During working hours, the RSO and/or the Radiation Safety Office can be reached at the Risk Management and Safety Department phone number (702-895-4226), which is attended by an office assistant from 8:00 AM to 5:00 PM, Monday through Friday. The RSO and Alternate RSO can also be reached at their personal office phone numbers listed in "Emergency Contact List". In addition, the RSO can be reached after hours, on weekends, or holidays, by calling UNLV dispatch at 702-895-3669. Finally, the Radiation Safety Office is equipped with three radios that can be used to communicate effectively in case of emergency.

13.3 Training and Exercises

The Radiation Safety Office personnel have thorough training and experience regarding emergencies involving radioactive materials. The Radiation Safety Office does not conduct specific Radiation Emergency Response training for University personnel. However, every Radiation Safety Training course, general or specific, includes Radiological Emergency instructions, which provide the trainee, with specific instruction in the case of an emergency involving radioactive materials and/or radioactivity.

13.4 Emergency Response Equipment

Appropriate Personal Protective Equipment, Decontamination Equipment, and Radiation and Contamination Sampling and Detecting Equipment are maintained and stored at two

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Decontamination Equipment