

RADIATION EMERGENCY NOTIFICATION AND RESPONSE

GENERAL INSTRUCTIONS FOR ANYONE

PURPOSE

General instructions, applicable to anyone, for responding to radiation emergencies are provided in the University's *Radiation Safety Policy Manual*. This procedure includes general instructions for notification of emergency response organizations, but also contains more detailed instructions for response to radiation emergencies by various individuals or organizations. It also provides specific procedures for responding to radiation emergencies in a few key facilities.

POLICY

The **Public Safety Department** is responsible for overall emergency response communication and coordination. The notification of appropriate response personnel and establishment of necessary communications link during emergencies are services provided by Public Safety.

The **Radiation Safety Officer (RSO)** is responsible for providing technical guidance and assistance on all emergencies involving or potentially involving radioactivity or radiation exposures. The **Radiological Health Department** must be notified promptly of all accidents or incidents involving radiation sources at the University of Utah. Members of the Radiological Health Department are authorized to act on behalf of the RSO and provide the staff and facilities to deal with radiation emergencies.

Facilities or groups with unique radiation emergency response requirements shall maintain and use the detailed procedures applicable to their needs; some of these special procedures are attached to this procedure.

REPORTING A RADIATION EMERGENCY

Communications

Rapid, concise communications are essential to an effective emergency response. Keep an emergency call list near the phone, with current numbers of individuals and organizations necessary to respond to any situation.

Radiation emergencies involving fire, explosion, building collapse, etc.

Call the Fire Department and University Police then notify the Radiological Health Department.

RADIATION EMERGENCY NOTIFICATION & ASSISTANCE

Ambulance; Fire Department 9-911

University Police 801-585-2677

**Radiation Safety Officer and
Radiological Health Department** 801-581-6141

Forwards call to University Police
Dispatcher at night or on weekends

MEDICAL RADIATION EMERGENCIES

**University of Utah Hospital
Telecom Dispatch** 801-581-2222

Ask for the House Supervisor
Specify that this is a
"Medical RADIATION emergency"

Radiation emergency involving an injury or illness

For serious medical emergencies, call an ambulance and/or notify University Police. **If the patient is contaminated with radioactive material, provide specific information on the extent of the contamination and the relative hazard, if known.** This information may be obtained from the Responsible User or other knowledgeable persons. Ambulance personnel may require this information before transporting the patient.

Inform the University of Utah Hospital House Supervisor of the estimated time of arrival for **injured, RADIATION emergency patients.** The phone number is **801-581-2222.**

All radiation emergencies

During normal office hours, **PROMPTLY NOTIFY the Radiological Health Department at 801-581-6141.**

At all other times, **notify the University Police Dispatcher, 801-585-2677**, who will then use a call list to contact the Radiological Health Department emergency response personnel. For emergencies involving specific facilities, the Radiological Health Department and/or the University Police dispatcher will notify appropriate resource persons.

How and what to report

When reporting a radiation emergency, **stay on the line** until you are sure that you provided all of the necessary information. Let the person you called end the conversation. Be sure to provide the following information:

1. Your name and phone number.
2. Location of emergency, i.e. building, specific rooms, etc.
3. Exact nature of the emergency; e.g. injuries, fire, spill, **radioactive materials involved**, etc.
4. Names of other people already notified or tried to notify but not reached.

RPR 45A. RADIATION EMERGENCY RESPONSE BY THE RADIOLOGICAL HEALTH DEPARTMENT PERSONNEL

PURPOSE

This procedure provides general guidelines for response by the Radiological Health Department personnel to radiation emergencies of all types. It also provides specific procedures for responding to radiation emergencies in a few key facilities.

POLICY

The **Radiation Safety Officer (RSO)** is responsible for providing technical advice and assistance on all emergencies potentially involving radioactivity or radiation exposures. Members of the technical staff of the **Radiological Health Department** (health physicists and radiation analysts) are required to know how to respond to emergencies and are authorized to act on behalf of the RSO during emergencies.

The **Public Safety Department** is responsible for overall emergency response communication and coordination. The RSO or designee will cooperate with the representatives of Public Safety to provide advice and technical support.

Responsible users of radiation sources are responsible for cleanup of spilled materials and for assuring that all individuals within their jurisdiction comply with monitoring and reporting requirements established by the RSO.

PREPAREDNESS

The most important factor that determines the adequacy and success of the response to an emergency is the preparedness of the responding individuals or organization. **True preparedness is a mental condition much more than it is a physical condition.** Although detailed procedures and specialized equipment are sometimes important, predetermined priorities and systematic thought processes are essential in all cases. Careful planning of who should do what and when

is often of greater importance than practicing of how specific jobs should be done, at least for individuals who are already technically competent. Clearly defined lines of responsibility and communications are key elements in emergency response preparedness.

Some facilities, e.g. the University of Utah Hospital Emergency Department and the Utah Nuclear Engineering Program (UNEP), have detailed emergency notification and response procedures. For all radiation emergencies, the Radiological Health Department or the RSO shall be notified. The first individual thus notified should ascertain the nature and extent of the emergency, the names of any other radiation safety personnel already notified and the need for additional assistance.

COMMUNICATIONS

Prompt emergency response requires mental preparedness and an effective communications system. For many emergencies, several organizations and individuals must be contacted rapidly. A reliable network is required to contact the necessary individuals and organizations and to relay information accurately.

During normal office hours, the initial notification of a radiation emergency should be received by the Radiological Health Department. Unanswered calls, e.g. those received after office hours, are automatically forwarded to the University Police Dispatcher, who then notifies the RSO and appropriate individuals for specific facilities as contained in the Notification List, RPR 45B.

When a member of the Radiological Health Department receives an emergency call, whether in the office or elsewhere, the following actions are important:

- I. **Ask the caller to stay on the line** until you are sure that you have all of the necessary information.

2. **Write down all of the information** you receive. It is better to take a little extra time to assure complete and accurate information than to overlook something through haste.
3. **Information to request and record:**
 - a. Caller's phone number
 - b. Name of caller.
 - c. Date and time of call.
 - d. Location of emergency, i.e. building, specific rooms, etc.
 - e. Exact nature of the emergency; e.g. injuries, fire, spill, quantities of materials, etc.
 - f. Names of other people already notified or tried to notify but not reached.
4. **Determine how much additional help may be needed** and, before disconnecting, determine whether or not the caller will or should call additional individuals. Continue the calling effort until at least one health physicist or the RSO has been notified and instructions are given to cease. **For each person contacted, record their name and the time contacted.**
5. Make certain that other emergency response personnel are notified as indicated for each of the following major types of emergency situations:

Fire, explosion, structure collapse:

Dial 9-911 to notify the Fire Department and the Public Safety Department

Illness or injury:

Dial 9-911 to call an ambulance; if the patient could be contaminated, notify the University of Utah Hospital, Telecom Dispatch, 801-581-2222

Utility or equipment failure:

Facility Maintenance, 801-581-7221

Chemical (other than radioactive) spills or releases:

Environmental Health Services, 801-581-6590.

RADIOLOGICAL CLASSIFICATION OF EMERGENCIES

Determining the proper response to an emergency requires that the type and magnitude be determined as rapidly as possible. If in doubt, it is better to over classify and over respond than to under classify and under respond. Regardless of the nature of the emergency, **radiation protection personnel must concentrate on the radiation aspects of the response and leave other concerns to the appropriate professionals**, if possible.

The **nature of radiation hazards** in an emergency may be any or all of the following:

External exposure to penetrating radiation

External personal contamination, e.g. on skin, hair or clothing

Internal personal contamination, e.g. injected through wounds, absorbed skin, inhaled or ingested

Equipment or facility contamination

Environmental release and contamination

The **magnitude of radiation hazards** may be categorized as:

Extremely serious. Radiation doses of biological significance, large releases of radioactivity to the environment, and accidents that cause major facility damage are considered to be extremely serious. Such events require **immediate notification of the regulatory agency by telephone and telegraph.** (See "Notifications to Regulatory Agencies" below.)

Serious. Any radiation dose that exceeds the annual occupational dose limit, any significant releases of radioactivity to the environment, or moderate facility damage is considered to be serious. Such events require **24-hour notification** by telephone and telegraph.

EMERGENCY EQUIPMENT

Emergency kits containing basic survey instruments, protective clothing, and supplies needed in emergencies are maintained in two locations. The instruments are miniature GM

survey meters with internal, energy-compensated, miniature GM tubes for measuring exposure rates, and external, thin-window GM detectors for evaluating contamination. Other instruments may be required, depending on the type and intensity of radiation, and should be obtained from the Radiological Health Department offices. For evaluating contamination on personnel, these emergency instruments should be supplemented as soon as possible with survey instruments with larger window areas.

RESPONSE GUIDELINES

The RSO (or Alternate RSO), if available, will normally be responsible for the response to the radiological aspects, if available. The Public Safety Department and the individuals responsible for specific facilities are responsible for the overall response to, and recovery from, the emergency. The responsible individuals are listed in the Notification List, RPR 45B.

The priorities for response by the RSO and personnel of the Radiological Health Department are:

- I. The **person in charge** of the radiation response to an emergency should avoid, if possible, becoming directly involved in performing rescues, giving first aid or containing radiation sources. Instead, his or her full attention should be devoted to **assuring that all necessary actions are being carried out as efficiently as possible.**
2. **Personnel control and dosimetry** should be assigned to one or more specific individuals. For this task, the response involves identifying and recording all individuals involved in the emergency, rendering first aid, surveying for personal contamination, decontaminating or containing clothing or personal articles, determining possible external exposures, collecting badges for special reading, releasing individuals to leave the area, etc. If injured persons are sent to the Emergency Department, be sure to attach a tag or note describing any contamination that may be present on skin or clothing. The most important equipment for this task will usually be a thin-window GM survey meter and a personnel decontamination kit containing detergent,

waterless hand cleaner, plastic bags, coveralls, towels, tape, etc.

3. **Control of radiation sources and facility contamination** is the second major response category. If enough help is available, this task should normally be assigned jointly to a radiation specialist and someone thoroughly familiar with the facility. The response includes controlling the event (fire, spill, etc.), determining the extent of any unconfined radioactive materials, determining any areas of high radiation exposure, controlling access to the area, etc. Since this task requires approaching or entering the emergency site, a personal dosimeter, appropriate protective clothing and, in some cases, respiratory protection should be worn. **Be sure of adequate protection before proceeding.** An exposure rate meter (ion chamber) with a thin window would be the primary radiation survey instrument for this response. The facility and source conditions must be reported to the person in charge as quickly as possible.
4. **Area and environmental sampling** is the third major task to be assigned. The most urgent aspect of this task is to ascertain the likelihood of an **airborne release** and exposure areas, whether indoors, outdoors or both. This involves a determination of airflow and exhaust patterns from the location of potential release and the wind direction. If a significant release is possible, initiate an air sample at the most likely location of exposure or highest concentration. Be sure to record start time, air flow rate, location and relevant environmental conditions. This task also involves checking for possible **surface contamination** in likely locations outside the immediate emergency zone, e.g. walkways, vehicles, etc.
5. **Documentation and reporting** of all data collected and actions taken in an emergency are very important. Each individual involved in the response should prepare and submit a written report covering his or her own activities. The report need not be lengthy or polished but it must be complete and factual. The RSO will determine to whom any comprehensive reports should be submitted and will prepare such reports.

NOTIFICATIONS TO REGULATORY AGENCIES

Notifications shall be made **only by or with the concurrence of the RSO**. The NRC and Utah DRC requirements for urgent notifications are shown below.

NOTIFICATION CRITERIA FOR SINGLE EVENTS		
<u>Radiation Dose to Individual</u>	<u>Immediate Notice</u>	<u>24-Hour Notice</u>
Total Effective Dose Equivalent	≥ 25 rem	≥ 5 rem
Dose to the Eye	≥ 75 rem	≥ 15 rem
Shallow Dose to the Skin	≥ 250 rem	≥ 50 rem
<u>Potential Intake from a Radioactivity Release</u>		
If an Individual had been present for 24 hours	≥ 5 ALI	≥ 1 ALI

RPR 45B. RADIATION EMERGENCY NOTIFICATION LIST FOR THE UNIVERSITY POLICE DISPATCHER AND THE RADIOLOGICAL HEALTH DEPARTMENT PERSONNEL ONLY

This list contains confidential information.
Contact the Radiation Safety Officer in the
Radiological Health Department at
801-581-6141 if you have any questions.

RPR 45C. EMERGENCY RESPONSE FOR THE UTAH NUCLEAR ENGINEERING PROGRAM (UNEP)

UNEP FACILITY

The UNEP located in room 1205 of the Merrill Engineering Building (MEB) houses the 100 kW TRIGA Research Reactor. The facility is licensed (R-126 Docket No. 50-407) and regulated by the NRC. The emergency response plans described here are excerpts from the facility's most current Nuclear Regulatory Commission (NRC) approved emergency plan entitled "University of Utah Center for Excellence in Nuclear Technology, Engineering, and Research Emergency Plan." A copy of the plan is available from the Office of the Vice President for Research, Radiological Health Department, or the UNEP's administrative office, MEB 1206.

Local Radiation Alarms

Alarm bells and a small, red light inside the fire hose cabinet beside the entrance to room 1205 MEB indicate that the radiation alarm has been activated. This light should not be confused with the red light above the door which is on whenever the reactor is operating; the light above the door also indicates that one or more operators are present. The radiation alarm bells and light will be on even if the alarm has been activated by an electrical malfunction and do not necessarily indicate the presence of hazardous radiation.

A radiation monitor readout is mounted inside the entrance of MEB 1205 directly above the door. If the meter needle is in the left (white) half of the meter dial and the alarm is not sounding, it is safe to enter any part of the facility. **If the needle on the radiation monitor is in the right (red) half of the meter dial (i.e. >5mR/hr) or the alarm is sounding**, do not proceed into the facility without an operating exposure-rate survey meter.

Emergency Planning Zone

The operations boundary for the UNEP (defined by rooms MEB 1205A-G in the Merrill Engineering Building comprising the Nuclear Reactor Laboratory)

is defined as the Emergency Planning Zone (EPZ) for the UNEP.

Emergency Response

Activation of the UNEP Emergency Organization

The Reactor Supervisor (RS) (or his or her designee) shall be responsible for initiating the emergency plan and for notifying and mobilizing the emergency organization. During periods of time when the UNEP facility is unattended and any unusual situation (lights on at night, alarm signal, suspicious behavior, etc.) is detected by University Police or reported to the University Police Dispatcher, a member of the UNEP staff shall be contacted by telephone. The emergency notification list is kept by the Police Dispatcher and copies are posted on the inner side of the entry door to the UNEP. The Police Dispatcher's desk is manned at all times insuring that a UNEP staff member on the list can be notified. The UNEP staff member who is first notified shall inform the RS who shall take charge of the emergency and provide instructions on steps to be taken to resolve or contain the situation before his or her arrival (if not present at the UNEP). Communication with other emergency support organizations shall be made by the Police Dispatcher as appropriate for the reported situation or as requested by the RS.

Protective Action Values

Because of the low power of the reactor and small potential activity of samples irradiated in it, it is likely that all exposures of emergency personnel will be within the limits of 10CFR20 and/or the Protective Action Guides (PAGs) of 1 rem whole body or 5 rem thyroid. However, the Radiation Safety Officer or his or her designee may authorize exposures more than these values to facilitate rescue of injured personnel or take corrective actions that will mitigate the consequences of the emergency event. The dose equivalent limit for life saving is 75 rem and 25 rem for corrective actions. In either case, these dose equivalents shall be on

a voluntary basis and shall be restricted to a once-in-a-lifetime exposure.

Radiological Health Department Emergency Response Program

The Reactor Supervisor shall be responsible for projecting and determining radiation dose and contamination levels both onsite and offsite and shall relay this information by direct oral communication, telephone communication, or short-wave radio to the individual responsible for accident assessment. In addition, he or she shall provide for isolation and supervise access control to restricted areas to minimize exposures to radiation and the spread of radioactive contamination.

Reporting of Emergencies

Emergency notification rosters are posted inside the doors of the UNEP and in the University Police Dispatcher's Office. Telephone numbers are listed for UNEP personnel, a member of the Radiological Health Department, and the University Police. Initial and follow up emergency messages to the UNEP and, if applicable, to other offsite government agencies should include the following information to the fullest extent known:

1. Name, title, and telephone number of caller, and the location of the incident.
2. Description of the emergency event and emergency class.
3. Date and time of incident initiation.
4. Type of expected or actual release (airborne, waterborne, surface spill) with estimated duration times.
5. The quantity of radionuclides released or expected to be released.
6. Projected or actual dose rates outside the operations boundary.

Emergency Response for Non Reactor Safety Related Events

Activation of the Emergency Organization for Non-Reactor Safety Related Events

The complete activation of the emergency organization for this emergency class should not be required normally. The RS (or UNEP Director) shall activate that portion of the emergency organization necessary to respond to the event. In any case, UNEP staff shall be notified.

Assessment Actions for Non-Reactor Safety Related Events

Civil disturbances or bomb threats shall be assessed by the RS for validity using campus police experience and the information source.

For personnel injury, the RS or UNEP staff present shall assess the extent of the injury and with support of the RSO determine whether radioactive contamination is present. Portable radiation monitoring devices are available in the UNEP for this assessment. The assessment shall consider the nature of the injury, the appropriate first aid, and the need for transportation to medical treatment facilities.

The RS shall assess fire or explosion events to determine the magnitude of the event, the need for prompt control, and the need for support from outside agencies. The Radiological Health Department and UNEP personnel shall monitor the area to determine if radioactive contamination is present.

Corrective Actions for Non-Reactor Safety Related Event

If there is a civil disturbance or receipt of a bomb threat non-specific to the reactor, the University Police shall be notified and shall initiate the appropriate controls to insure the protection of personnel and property. The RS shall be informed of the emergency status.

For minor fires or explosions non-specific to the reactor or its control system, the RS shall be notified and UNEP staff members may attempt to control the fire with portable fire extinguishers if it is safe to do so. The Salt Lake Fire Department shall be notified by the Police Dispatcher. The Radiological Health Department shall be notified of fire in the UNEP.

For cases of personnel injury with or without radiological complications, the RS or UNEP senior

staff shall determine what medical assistance is needed and may contact the Police Dispatcher to request transportation. If the injured individual is contaminated, decontamination shall be attempted only if it is judged that this shall not further aggravate the injury. A contaminated injured individual shall be transported using contamination and isolation methods.

Protective Actions for Non-Reactor Safety Related Events

Some protective actions at this level of emergency (e.g., fire alarms) may require the evacuation of the Merrill Engineering Building. In this case, UNEP staff members will assemble at the west entrance to the Merrill Engineering Building to determine if their services are needed. All evacuations shall be initiated by sounding the fire alarm and notifying personnel by word of mouth. Should a fire or other event involve areas with radioactive material, the RS shall control access to the areas and shall be responsible, with support from Radiological Health Department personnel, for the segregation of potentially contaminated personnel.

Emergency Response for Notification of Unusual Event

Activation of the Emergency Organization for Notification of Unusual Events

The RS (or UNEP Director) shall activate that portion of the emergency organization necessary to respond to the emergency. In addition, the RSO and the Public Safety Services Representative (PSR) (if one is assigned) shall serve as technical advisors and assistants to the RS in assessing and implementing emergency activities.

Assessment Actions for Notification of Unusual Events

Fuel damage, experiment failure, or any event manifested by unusual radiation levels within the Reactor Laboratory or the release of effluents at the site boundary shall be assessed by the RS with assistance from available personnel. Additional support for assessment shall be requested from the Radiological Health Department if needed. The assessment shall consist of an observation and evaluation of facility air and/or radiation monitors in the control room and Reactor Room and the use of

portable survey instruments. Excessive levels may require evacuation of the UNEP and future assessment shall be made from the Emergency Support Center.

A high volume air sampler is available and collected filter paper and swipe samples can be counted in the Counting Laboratory located in 1205C to assist in identifying isotopes. This shall be used to assess whether the source is due to fission products, irradiation products, or a non-reactor source.

Civil disturbances and bomb threats shall be assessed by the RS for validity and specificity using campus police experience and the information source.

Explosions and fires in the UNEP shall be assessed by the RS through observation of the affected area and by observation of fire alarms. The Salt Lake City Fire Department may be summoned by the Police Dispatcher. UNEP personnel or staff from the Radiological Health Department will monitor the area to determine if radioactivity is present.

Excessive pool water loss is assessed by the RS through the low water level alarm, visual observation of the leakage rate, and readings of the reactor area radiation monitors. Leakage that causes the water level to drop quickly may require evacuating the Reactor Room until makeup water can be added.

Corrective Actions for Notification of Unusual Events

If a Notification of Unusual Event is dictated by assessment of high radiation levels, the Reactor Laboratory may be evacuated pending an evaluation and identification of the probable source. The RS, in conference with UNEP staff and personnel from the Radiological Health Department, shall control access to the Reactor Laboratory until radiation and airborne activity levels have been restored to normal. All personnel who were in the UNEP at the time of the emergency shall be accounted for. Members of the Reactor Operations staff will assemble at the designated places. Other personnel shall assemble in the conference room to be available for assistance.

For bomb threats with possible radiological release implications, the University Police Dispatcher, the Head of the Department of Public Safety, the Reactor Supervisor and the Director of UNEP shall be notified. The RS may initiate controls to insure the protection of personnel and property. The reactor shall be shut down and personnel may evacuate to the assembly area (or alternatives). In case of fire or explosion within the UNEP, the management shall be notified and the Salt Lake City Fire Department will be summoned. The Radiological Health Department shall be notified of fire in the UNEP. In addition, the RS shall ensure that the reactor is shut down and that personnel are evacuated from the Reactor Laboratory. All personnel who were in the UNEP at the time of fire or explosion shall report to the west entrance of the Engineering Building to be accounted for. The RS shall monitor the extent of the fire and brief the fire department personnel upon their arrival. Pool water loss resulting in excessive radiation levels shall require evacuation of personnel from the UNEP as determined by the RS.

Protective Actions for Notification of Unusual Events

For this emergency class, the Reactor Laboratory may be evacuated according to facility Operating Procedures. In such cases, all personnel shall be verified present at the ESC, and those individuals who exited the Reactor Laboratory shall be surveyed for contamination using portable instruments. Those who are contaminated shall remain in a room designated by the RS to await instructions from Radiological Health Department personnel. The RS shall be responsible for limiting Reactor Room or Reactor Laboratory access to rescue and emergency response operations only.

The RS, with assistance from the RSO, shall be responsible for minimizing personnel exposure and spread of contamination. Emergency exposure levels for personnel shall be in accordance with guidelines laid out in the Protective Action Values section of this document.

Emergency Facilities and Equipment

Emergency Support Center (ESC)

Room MEB 1208 immediately south of the UNEP shall serve as the Emergency Support Center (ESC) for emergency actions. The purpose of this center is to serve as a control center and accountability station for persons in the area affected by the emergency. The location of the ESC controls access to the main entrance leading to the UNEP. Personnel may be assigned from the ESC to the North (emergency) exit from the UNEP, thus controlling access to all entrances leading to the UNEP. The facility emergency kit is located in MEB 1208. Telephones are available in the ESC and in adjacent offices.

Assessment Facilities

The UNEP has area radiation monitors with readouts and alarm indications in the reactor control room. The UNEP and the Radiological Health Department have radiation counting laboratories and portable survey instruments available for emergency use. If necessary, additional counting equipment and survey instruments are available from other University departments and facilities. The UNEP and the Radiological Health Department maintain gamma ray spectrometers for radioisotope identification. A portable high volume air sampler for collection of airborne particulate radioactivity is available in MEB 1205C. Two reactor tank radiation alarms and a continuous radiation alarm system and fuel temperature indicator in the TRIGA Control room provide system or status information for emergency assessment.

First Aid and Medical Facilities

Accidents resulting in personal injury without contamination shall be handled by administering first aid and summoning an ambulance, if needed. If there is an injury requiring medical treatment for contamination, the individual shall be transported to the University of Utah Hospital, which is located about one-quarter mile from the Merrill Engineering Building. Either the UNEP or the Radiological Health Department personnel shall accompany the contaminated injured victim to the hospital which has emergency facilities and procedures for treating radiation contaminated patients. Requests for ambulance transport shall be made through the University Police Dispatcher who shall contact the ambulance service that has a support agreement with the University of Utah.

Decontamination Facilities

Decontamination of personnel at the UNEP can normally be handled in the UNEP TRIGA Reactor Room, MEB 1205E, and Radiochemistry Laboratories, MEB 1205F and MEB 1205G, or in Laboratory Classroom, MEB 1205, which is immediately next to the TRIGA Reactor Room. MEB 1205F and MEB 1205G have sinks with soap, paper towels, and contaminated waste containers. In an emergency where these facilities are not available, MEB 1205 or MEB 1208 may be used for segregation of contaminated personnel and for decontamination. UNEP staff and the Radiological Health Department personnel shall be responsible for decontamination of individuals involved in an emergency.

Communications Systems

Telephones are located in the UNEP Control Room, MEB 1205D, in the Radiation Counting Room, MEB 1205C, in the Office, MEB 1205A, in the Emergency Support Center, MEB 1208, and elsewhere in the Merrill Engineering Building, and may be utilized during emergencies. Direct verbal communications shall provide a backup for radio and telephone communications. The University Police shall be summoned also by activation of the security alarm system within the UNEP Control Room. University Police maintain a radio system for communication between police officers, the dispatcher, and patrol cars.

Recovery Operations

Restoring the UNEP to a safe operating condition after an emergency shall be the responsibility of the RS and his or her staff. Operations necessary to restore the facility shall be under his or her direction. The Radiological Health Department staff shall assist in surveying and supervising.

RPR 45D. RADIATION EMERGENCY RESPONSE FOR AMBULANCE PERSONNEL

PURPOSE

This procedure provides guidelines for ambulance personnel transporting patients who might be contaminated with radioactive materials to or from the University of Utah facilities. The procedure includes information on communications and on precautions for personal protection.

POLICY

The University's **Radiation Safety Officer (RSO)** or his or her designee must be notified promptly of all accidents or incidents involving radiation at the University of Utah. The RSO is responsible for providing technical guidance and assistance on all emergencies involving or potentially involving radiation exposures or contamination with radioactive materials. Employees of the **Radiological Health Department** are authorized to act on behalf of the RSO and to provide advice on radiation exposures, risks and protection, and to deal with radiation emergencies.

The **University Police Dispatcher** is responsible for emergency communication. The University Police dispatcher, available 24 hours a day, will notify emergency response personnel and establish necessary communications links during emergencies.

COMMUNICATIONS

An effective communications system is vital to prompt emergency response. Use the attached call list to contact the necessary individuals and organizations and to relay information accurately.

During normal office hours, **the first notification of a radiation emergency should be to the Radiological Health Department (801-581-6141).** If not answered, e.g. during off-hours, the call will be transferred automatically to the University Police Dispatcher who will then contact the RSO and/or other radiation emergency response personnel. For emergencies involving principal radiation facilities, the Radiological Health and/or the University Police Dispatcher will notify appropriate resource persons.

RADIATION EMERGENCY NOTIFICATION & ASSISTANCE

**Radiation Safety Officer and
Radiological Health Department** 801-581-6141
Forwards call to University Police
Dispatcher at night or on weekends

University Police Dispatcher 801-585-2677

MEDICAL RADIATION EMERGENCIES

**University of Utah Hospital
Telecom Dispatch** 801-581-2222
Ask for the Charge Nurse
Specify that this is a
"Medical RADIATION emergency"

RESPONSE PROCEDURES

Upon responding to an emergency call, request the following information about the radioactive materials involved:

1. Ask a knowledgeable person such as the laboratory supervisor, the victim, or the Radiological Health personnel for the **type of radioactive materials** being used. Alternatively, obtain the information from the radiation warning sign located on or near the entrance to the laboratory.
2. Ask about and/or observe the routine **radiation protection precautions** being taken by the laboratory personnel. If the researchers are wearing lab coats and gloves, use similar precautions to avoid becoming contaminated.
3. If the patient may be contaminated with radioactive material, immediately inform the University of Utah Hospital Charge Nurse by calling Telecom Dispatch at 801-581-2222.

RADIATION RESPONSE CHECKLIST

At the Emergency Location:

Who called for the ambulance?

Caller's phone #: _____

Caller's campus location?

Bldg: _____ Room: _____

Name of Responsible User?
(posted on the laboratory door)

Radioisotopes in use?
(posted on the laboratory door)

_____ Iodine? **Yes No**

Physical form of spilled radioactive materials? Solid? _____ Liquid? _____

If the RSO Designee has not arrived, call the persons listed on the laboratory door and the University Police for assistance in contacting the Radiological Health Department emergency personnel.

Before Transporting a Victim:

Make sure that the University of Utah Hospital Charge Nurse is notified of the estimated time of arrival of "a radiation emergency with injuries".

At the Hospital:

Do not leave the University of Utah Hospital Emergency Department without authorization from the RSO Designee. Decontamination of the ambulance may be required.

4. When in doubt, follow the **Radiation Response Check List** during preparations for emergency transport.

Accidents involving victims exposed to radiation do not necessarily create an exposure risk to ambulance personnel or equipment. When victims

are **contaminated (usually from spilling radioactive materials onto clothing and skin)**, small amounts of radioactive materials, like "dirt", may be transferred to emergency personnel and equipment.

Never withhold lifesaving care or transportation for fear of radiation! At the University of Utah, there are no radiation accident scenarios that would seriously injure an emergency responder due to transfer of the patient's contamination.

However, transfer of contamination can be minimized by the use of aseptic techniques (avoiding hand-to-mouth actions), and most contamination (radioactive "dirt") is easily removed by simple cleaning methods, e.g. washing with water and mild detergents. (NOTE: A simple and quick decontamination process is all that is required.)

If available, use a Geiger counter to find radioactive contaminants since the contaminants on the victim may not be seen. Personnel from the laboratory or the Radiological Health Department can provide information on safe handling techniques.

GENERAL PRECAUTIONS

1. **Use aseptic techniques and avoid hand-to-mouth movements.** Like pathogenic bacteria, most of the radioactive materials used on the University of Utah campus do not constitute a hazard unless they are introduced into the body through ingestion, inhalation, or wounds. Therefore, surgical type precautions, clothing, mask and gloves are appropriate when treating contaminated victims of radiation accidents.
2. Wear disposable surgical-type clothing, e.g. lab coat and gloves. Clothing that becomes contaminated must be treated as radioactive waste. The handling technique is similar to that used for handling of pathogenic bacteria. **Use separate plastic bags for radioactive disposables. Do not mix radioactive wastes with biohazard chemical wastes.**
3. For victims contaminated with radioactive materials, remove, bundle, bag and isolate the

victim's contaminated clothing. Similarly, dispose of contaminated EMT clothing. Place contaminated materials in plastic bags to prevent dispersal of the radioactive dirt. If possible, wrap the patient in a **disposable** sheet, blanket or other material prior to transport. This will minimize the transfer of contamination to ambulance and equipment. As with infectious materials, isolate items potentially contaminated with radioactive dirt. Unlike infectious materials, once the wastes are bagged, it is an appropriate precaution to place the bags at a distance of at least six (6) feet from both EMT's and victims. **Retain all contaminated materials for disposal by the Radiological Health Department personnel.**

4. Victims of exposure to radiation (but who have not been contaminated, e.g. persons exposed to x-ray machine or sealed source radiations) do not constitute a hazard to the EMT. To minimize additional exposure to the patients from a sealed radiation source, the EMT should quickly extricate the victims and move them from the immediate accident location.
5. Some radioactive materials emit radiation that can easily be detected by a Geiger counter. For EMT protection, work quickly to administer lifesaving care; thereafter, minimize the time that the EMT is closer than six (6) feet to any sources of radiation.