

EMERGENCIES AND ACCIDENTS

EMERGENCY NUMBERS:	Contact
Emergency Services (ALWAYS inform them that the emergency is in an area using ionising radiation or radioactive material)	(0)000
University Radiation Safety Officer: Dr Kent Gregory	0410 388 018
Human Resources	83134638 or 83131111 or 0404489059 or 0410422737
Radiation Protection Branch of the EPA	8463 7826

Please note that any serious radiation incident will need to be reported by the URSO to the EPA and reported by Human Resources to SafeWork SA.

CONTINGENCY PLANS

- The Head of School must ensure that contingency plans are developed and tested in accordance with the [HSW Emergency Management Chapter](#) which cover the use of ionising radiation in their area.
- The contingency plan must be prepared and tested before the commencement of the kind of operation to which it relates.
- The contingency plan must—
 - a. take into account every radiation incident and radiation emergency that is reasonably foreseeable; and
 - b. contain specific instructions as to how each such accident and emergency is to be dealt with, paying particular regard as to how control may be restored and the exposure of persons may be kept to a minimum; and
 - c. staff and students must be trained in responding to the foreseeable accidents or emergencies.
- The Head of School must ensure that the equipment and facilities (including any monitoring instrument, detector or alarm) that are necessary for the effective operation of the contingency plan are provided and maintained in correct working order.

UNSEALED RADIOACTIVE MATERIALS EMERGENCY ACTIONS

RADIOACTIVE SPILLS

Note if the incident is **serious** (hospitalisation or clean up requiring MFS) then dual reporting will be required (Radiation Branch of the EPA and SafeWork SA). The site is not to be cleaned until the Radiation Branch of the EPA and SafeWork SA approval is granted.

- Manage any injury (where applicable)
- Assess the situation and avoid contaminating other areas.
- Evacuate the area if necessary (also lock and place a sign in the area)
Advise – the licensed supervisor, University Radiation Safety Officer and [Human Resources](#). (83134638 or 83131111 or 0404489059 or 0410422737).
- Clean up and decontaminate in the following order (treat all cleaning materials as radioactive waste):
 - a. People
 - b. Laboratory (only when clean-up is approved)
 - c. Equipment (only when clean-up is approved)
- Record the incident in accordance with [HSW Handbook Incident Reporting and Investigation](#) specifically including the following information:
 - a. The time, date and place
 - b. The names of those involved, including anyone who may have been affected by the incident
 - c. The quantity of radioactive material involved, its physical and chemical form and the extent of any dispersal of a radioactive substance. It is important to estimate the amount of activity involved in Becquerel (or Curie).
 - d. The length of time the radioactive material was out of control and when it was reported to licensed supervisor.
 - e. The probable cause of the incident.
- Human Resources and the University Radiation Safety Officer will follow up with an investigation of the incident and report to the Radiation Branch of the EPA and, where required, SafeWork SA.

Please note that if an incident causes an exposure close to or over 20 mSv the University will not allow the staff/student to continue radiation work for a full year.

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Spill Kit for Unsealed Radioactive Materials

In general, the requirements for a spill kit for unsealed radioactive material are the same as for a chemical spill involving similar chemical forms. The one major difference is where radioactive iodine (I-125 or I-131) is being used. With radioactive iodine it is important that spills do not oxidise the iodide to volatile iodine, and a reducing agent (5% sodium thiosulfate solution) must be included in the spill kit. If an iodine spill does occur, quickly add sodium thiosulphate to the spill (in an equal volume), place a plastic sheet over the top, exit the room and secure it from other workers. Immediately inform Human Resources for assistance. (83134638 or 83131111 or 0404489059 or 0410422737)

Spill Kit Contents

- PPE – safety glasses and gloves
- Absorbent material of various kinds for liquid spills:
 - a. Vermiculite (packaged in various ways by vendors – choose that which suits your situation best);
 - b. Absorbent paper and tissues;
 - c. Coated bench protector absorbent paper (e.g. 'Benchkote').
- Variety of plastic bags for the waste absorbent and paper – these should be suitable for transfer to the yellow waste pails.
- Plastic sheeting (polythene is suitable) for covering contaminated areas until hard clean-up and decontamination can be done.
- Strong adhesive tape for fastening the sheet down on the bench, floor or other surface.
- Decon-90 or other appropriate detergent-based cleaning agent. For unusual chemical forms provide a suitable chemical agent for decontamination.
- For radio-iodine, a 5% solution of sodium thiosulfate to keep the iodine in the reduced iodide ion state. This solution slowly oxidises and precipitates elemental sulfur. It should be freshly made up regularly.
- A small whiteboard and marker pens so that the area can be sign-posted and a notebook and pen for recording the circumstances of the incident.

DECONTAMINATION

Personal Decontamination

When decontaminating people, be as gentle as possible as violent methods can cause the contamination to pass through the skin.

Skin

- Monitor the skin and get help if necessary; an assistant to monitor the progress is very helpful.
- Remove contaminated clothing if necessary and secure in a plastic bag.
- Rub with paper towels, warm water and mild soap, then monitor again.
- Scrub - soft brush – do not damage the skin, then monitor again.
- Use a decontamination product like 'Count-off'.
- If still contaminated – get advice from licensed supervisor and/or University Radiation Safety Officer.

Face and Eyes

- Wash only with warm water or sterile saline solution.
- Be careful not to swallow or inhale contamination.
- If washing with water does not remove the contamination, call the licensed supervisor and University Radiation Safety Officer.

Other Parts of the Body

- Do not spread contamination.
- If the person's hair is contaminated keep run off away from nose and mouth when showering.
- Rinse rather than scrub.
- Remove and dispose of all contaminated clothing – do not leave the lab in contaminated clothes but arrange for a new set to be delivered.

Wounds

- Wash only with warm water.
- If washing with water does not remove the contamination, call the University Radiation Safety Officer or the EPA.

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Ingestion and Inhalation

Internal contamination requires professional medical assistance.

You must call the University Radiation Safety Officer IMMEDIATELY (0410 388 018 or 83134638)

Laboratory Decontamination

For items like trays, benches, equipment and the floor.

- Restrict access until cleaned up.
- Mop the spill with tissues and dry the surface.
- Monitor.
- Decontaminate any remaining hot spots by working from outside inwards with Decon 90; scrub if needed.
- Do not contaminate the cleaning solution – use paper towels/tissues only once.
- If still radioactive then contact Human Resources for advice 83134638 or 83131111 or 0404489059 or 0410422737.

SEALED SOURCES

Loss of control in a closed area (laboratory)

If a sealed source is no longer in its normal shielded container the dose rates may be high. In these circumstances it is most important to leave the area, secure the door and plan a recovery operation. This may involve locating the source using a radiation monitor. Check the dose rate outside the locked room and place Do Not Enter signage on the door. Estimate the radiation field from the unshielded source – what dose will be received if it is recovered with 1 metre tongs? How long can a person operate in the area? In the worst case, call for assistance from the University Radiation Safety Officer or the Radiation Protection Branch of the EPA, after making certain that no-one can enter the area.

Record an incident in accordance with the [HSW Handbook Incident Reporting and Investigation](#).

Loss of control in a vehicle accident

Neutron moisture probes are the most likely sealed source to be transported in a vehicle.

The possibility of loss of control of a sealed source in a vehicle accident or emergency is high. The person in charge of the vehicle, or another responsible person, must notify the University Radiation Safety Officer and the Radiation Protection Branch of the EPA as soon as possible.

If the source is properly secured in the vehicle it will not be a major hazard in most road accidents as it will remain in the holder in its carrying case. Emergency Services are trained to handle a situation involving a radiation source, but they must know there is a source in the vehicle.

Record an incident in accordance with the [HSW Handbook Incident Reporting and Investigation](#).

Loss of control due to a break down in the field

The mechanical breakdown of a moisture probe in the field can be more difficult to handle than the same problem on campus because the proper resources may not be available.

When used in the field:

- Emergency signs and warning tape must be carried so that the source area can be marked off if mechanical failure occurs.
- Mark the area around the broken source as a radiation hazard.
- Inform the University Radiation Safety Officer and the Radiation Protection Branch of the EPA.
- Do not leave the source unattended unless help cannot otherwise be obtained.
- Record in incident in accordance with the [HSW Handbook Incident Reporting and Investigation](#).

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X-RAY UNITS

If the Emergency Services are called ALWAYS inform them that the emergency is in an area where an X-ray unit is normally in use. Make sure they are informed that EITHER the X-ray unit is turned off and is safe or that it is still operational and special precautions will be needed (this should be an extremely rare event).

Summary of Emergency Actions

- Turn off the machine
- Manage any injury - refer the exposed person for medical examination.
- Advise your licensed supervisor and University Radiation Safety Officer.
- Do not take action to correct the fault that caused the exposure. It will be difficult to estimate the absorbed dose if the fault has been corrected.
- Tag out the unit.
- Disconnect the unit from the power and lock the room.
- Record the incident in accordance with the [HSW Handbook Incident Reporting and Investigation](#) and report (if not already done) to the licensed supervisor, the Head of School, Human Resources and the University Radiation Safety Officer.
- The investigation is to be conducted by the University Radiation Safety Officer, Human Resources and the licensed supervisor. An investigation report shall contain:
 - a. details of the incident/accident including: - the time, date and place.
 - b. the names of those involved, including anyone who may have been affected by the incident.
 - c. a description of the incident.
 - d. the results of any dose assessments that have been made, and
 - e. actions taken to prevent the event from happening again.

XRD and XRF

If a user of X-ray analysis apparatus detects or suspects an unnecessary or unexpected radiation field, they must immediately:

- de-energise the apparatus; and
- notify Human Resources (83134638 or 83131111 or 0404489059 or 0410422737) who will notify the University Radiation Safety Officer of the incident.
- Record the incident in accordance with the [HSW Handbook Incident Reporting and Investigation](#) and report (if not already done) to the licensed supervisor.

A person must not re-energise or modify an apparatus that has been de-energised due to a detected or suspected unnecessary or unexpected radiation field until such time as the University Radiation Safety Officer has:

- inspected the apparatus;
- conducted an investigation; and
- approved of any proposed actions.

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