A. Purpose

When a spill occurs, efforts should be directed at minimizing personnel exposure and contamination and containing spread of contamination. When spills are associated with other events such as fire or explosion, the risks from radiation exposure may be minimal compared with the risk from other hazards and the need to care immediately for injured personnel.

B. Applicability/scope

This policy applies to all facilities where radioactive materials (RAM) are used or stored that are under the cognizance of Columbia University Radiation Safety Program. This includes, but is not limited to:

- Columbia University Medical Center
- New York Presbyterian Hospital
- Allen Hospital
- Morningside campus
- Manhattanville campus
- Lamont Doherty Earth Observatory
- Nevis Lab
- Barnard College
- New York State Psychiatric Institute

C. Definitions

EH&S – Environmental Health and Safety

RSO – Radiation Safety Officer

D. Procedures

The Radiation Safety Office is available and on call 24 hours a day for emergency spills. Call the Radiation Safety Officer (RSO) whenever there is a spill. Let him/her evaluate the spill and decide whether the lab workers can conduct cleanup efforts. It may be necessary for the RSO to notify and seek assistance from city or state radiation control officials.

In the event of a spill call

- **Morningside, Nevis, LDEO, Barnard College, Manhattanville:** 212-854-4442 during business hours. After hours, call Public Safety at 212-854-2797 or 212-854-5555 and request Radiation Safety assistance.

- **CUMC:** 212-305-0303 during business hours. After hours, call Public Safety at 212-305-8100 or 212-305-5-7979 and request Radiation Safety assistance.
1. If injuries occur – call Public Safety immediately and request medical assistance.

2. Immediate action following a minor spill - Spill Response Procedures (SWIMS)
   a) **Stop** all work. Prevent the spread by covering the spill with absorbent paper;
   b) **Warn** persons in the area that a spill has occurred;
   c) **Isolate** the area to prevent individuals from entering. Remove all personnel from immediate spill area to safe meeting area in or near the lab;
   d) **Minimize** further exposure by donning appropriate PPE including two layers of gloves and booties;
   e) **Survey** spill area and mark contaminated areas with grease pencil, magic marker or CAUTION – RADIOACTIVE MATERIAL tape.

   Additional steps:
   f) **Call** a RSO. Let him/her evaluate the spill and decide whether Radiation Safety Program personnel should respond to assist with cleanup efforts. It may be necessary for the Radiation Safety Officer to notify and seek assistance from city or state radiation control officials;
   g) **Shut off** ventilation, close windows and doors, turn off hoods, if possible. *Do not do this if radioactive gas is involved*;
   h) **Don** personal protective equipment (PPE) – double gloves, lab coat, eye protection and double booties;
   i) **Check** all personnel for skin and/or clothing contamination with an operable survey instrument;
   j) **Collect** supplies necessary for decontamination
      i) Absorbent paper or pads
      ii) Additional gloves and booties
      iii) Plastic bags for radioactive waste
      iv) Spray bottle with soap and water or cleansers
   k) **Begin** decontamination efforts, starting with low-level contamination and working towards the center or highest contamination areas. Clean up the spill using absorbent paper or pads with the clean side out and place in a plastic bag for transfer to radioactive waste container. For surface decontamination, use soap and water and cleansers appropriate to the compound spilled. Work slowly and deliberately, surveying continuously; and
   l) **Remove** contaminated clothing;
   m) **Decontaminate** personnel and resurvey;
   n) **Perform** a final survey to document that the area has been successfully decontaminated.
   o) **Fill out** “Incident Report” form.

3. Major spills*:
   a) **Clear** the area. Notify all persons not involved in the spill to vacate the room.
   b) Prevent the spread of contamination by covering the spill with absorbent paper labeled “caution radioactive material,” but do not attempt to clean it up. To prevent the spread of
contamination, clearly indicate the boundaries of the spill and limit the movement of all personnel who may be contaminated.

c) Shield the source if possible. Do this only if it can be done without further contamination or a significant increase in radiation exposure.

d) Close the room and lock or otherwise secure the area to prevent entry.

e) Notify the Radiation Safety Office immediately.

f) Decontaminate personnel by removing contaminated clothing and flushing contaminated skin with lukewarm water, then washing with mild soap. If contamination remains, the RSO may consider inducing perspiration. Then wash the affected area again to remove any contamination that was released by the perspiration.

* The decision to implement a major spill/contamination procedure instead of a minor spill/contamination procedure depends on many incident-specific variables, such as the number of individuals affected, other hazards present, likelihood of contamination spread, types of surfaces contaminated, and radiotoxicity of the spilled material.

For some spills of radionuclides with half-lives shorter than 24 hours and in amounts less than five times the lowest ALI, an alternative spill/contamination procedure may be to restrict access pending complete decay.

Use Table N.1 as general guidance to determine whether a major spill/contamination procedure or a minor spill/contamination procedure will be implemented. All spills/contaminations of radium-226 will be considered major spills.
Estimate the amount of radioactivity spilled. Initiate a major or minor spill/contamination procedure, based on the following information. Spills above these mCi amounts are considered major, and below these levels are considered minor. Spills involving curie quantities of PET radionuclides should initially be considered major spills; either downgrade to a minor spill after decay or restrict access pending complete decay.

E. Medical Surveillance

Decontaminate personnel by removing contaminated clothing and flushing contaminated skin with lukewarm water, then washing with mild soap. If contamination remains, the RSO may consider inducing perspiration. Then wash the affected area again to remove any contamination that was released by the perspiration.

F. Recordkeeping

Fill out “Incident Report” form

G. Appendices

N/A

H. Forms

References

Columbia University Radiation Safety Manual:

J. Acknowledgements (optional)

N/A