**Radiation Safety Guide for Ancillary Personnel**

**Introduction**

There are many people on campus who work near or in areas in which radioactive material is used or stored without directly working with it themselves. This may include administrative/office personnel, facilities management employees, students, custodians, and others. The Radiation Safety Office of the Department of Risk Management and Safety has developed this guide to provide basic radiation safety information for ancillary or support personnel who occasionally work in areas posted with the radiation symbol. Ancillary personnel are not allowed to use or handle radioactive materials.

**The Radiation Symbol**

All radioactive materials and radiation-producing devices must be labeled with this universal trefoil symbol for radiation. Only personnel properly trained by the Radiation Safety Office may handle materials or devices labeled with this radiation symbol.

**What is Radiation?**

Radiation is the emission of energy from matter. Some atoms are unstable and decay by emitting energy. These unstable atoms are referred to as ***radioactive***, and the energy they emit is called ***radiation***. The radiation emitted can be in the form of tiny subatomic particles, or it can be bundles of energy called photons. There are two types of radiation: ionizing and non-ionizing radiation.

***Ionizing*** radiation emitted by radioactive material has enough energy to knock electrons out of atoms. It is because of this ionization process that radioactive material can sometimes pose a risk to health. Ionizing radiation such as alpha, beta, and gamma has sufficient energy to cause chemical changes to biological molecules. A large exposure to ionizing radiation may damage cells or tissues. Sources on campus of ionizing radiation include radioactive materials and radiation-generating machines.

***Non-ionizing*** radiation has less energy, and is not capable of knocking electrons from atoms, but can only excite electrons to higher energies. Non-ionizing radiation includes visible light, ultraviolet light, infrared light, television waves, radar waves, radio waves, and microwaves; it may deposit thermal (heat) energy in the body, or have no effect at all.

Radiation has always been present on Earth and is part of our natural environment. ***Background radiation*** is the term used for the natural radiation that surrounds us. Sources of natural radiation include cosmic rays, terrestrial radiation from the ground (including radon), the air we breathe, food we eat, wood and concrete in building materials, and the human body itself.

Besides being a valuable research tool, radiation is also used in the medical field to diagnose and treat many illnesses. Radioactive material is also found in consumer products such as smoke detectors, tobacco, cosmetics and self-illuminating devices, including some exit signs, gun sites, and watches.

**What is a Radiation Dose?**

A ***radiation dose*** is an amount of ionizing radiation that is absorbed by your body. The rem or millirem ($1/1000^{th}$ of a rem) is a unit for measuring biological damage from radiation. State and federal regulations limit the radiation dose to a member of the general public or a non-radiation worker to 100 millirem (mrem) per year (from university operations).

In comparison, the average background radiation dose to a person living in the U.S. is about 360 mrem per year. A typical chest or dental x-ray exam delivers a radiation dose of 10 mrem to the patient.

**Radiation Laboratories**

There are many radiation laboratories at OU that use radiation for research. They are identified by the radiation symbol on the doors or storage cabinets. Working in rooms in which radioactive material is used or stored is very safe as long as simple precautions are taken, and common sense is used. Before performing any tasks in these areas, ancillary personnel should contact the laboratory personnel or contact the Radiation Safety Office.

**Rules To Follow**

There are minimal risks associated with using ionizing radiation. These risks are no greater than other common activities such as using power tools, climbing a ladder, or using electricity. By following these basic rules, you can ensure your safety while working in areas posted with the radiation symbol.

1. Follow all posted instructions carefully.
2. Announce yourself and state your purpose when entering a lab.
3. If no one is present in the lab and you think a situation exists that requires contacting the principal investigator or lab supervisor, call the numbers inside the lab or look up their number from the University phone book. After hours contact should be directed to the OU police at 593-1911.
4. Ask the laboratory personnel to identify areas that should be avoided.
5. Do not handle anything labeled with the radiation symbol and do not empty radioactive waste containers.
6. No food or beverages can be kept or consumed in areas posted for radioactive material use or storage; personnel may not bring food/drinks into these areas, nor may food containers, wrappers, etc., be disposed of inside radioactive material restricted area waste containers. In addition, other activities that involve hand-to-mouth motion (application of cosmetics, gum chewing, etc.) should be avoided. Do not place items such as notebooks, pens, tools, etc. in posted radioactive material use areas. The items could become contaminated if you do.
7. All equipment and furniture from labs must be checked for contamination by the Radiation Safety Office before being discarded, moved to another lab, or transferred elsewhere.
8. Call the Radiation Safety Office at 740-593-1661 if you have any questions or concerns.

**What Should I Do If?**

**There is an emergency**?

If there is a personal injury or other major emergency (such as a fire), follow the normal emergency procedures and disregard any concern about radiation exposure. The potential of receiving any measurable radiation dose is minimal. After the emergency is over, evacuate the area and contact the Radiation Safety Office.

**There is a spill?**

If the spill is in a radiation laboratory or involves radioactive material, do not attempt to clean up the spill yourself. Secure the area, notify the laboratory supervisor and any personnel in adjacent labs, and contact the Radiation Safety Office or OU police, if after hours.

**I have to repair equipment?**

You should never attempt to repair equipment with a radiation symbol unless it has been surveyed by the Radiation Safety Office and declared free of radioactive contamination.

**I have to repair facilities?**

All structures potentially contaminated with radioactive material are labeled with the radiation symbol. Notify the Radiation Safety Office before repairing drains, air ducts, or other structures labeled with the radiation symbol.

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