

(Revised 3/20)

DOSIMETRY PROGRAM

Dosimeters are used to detect and measure an individual's dose from external radiation. The dosimetry program allows Environmental Health and Safety (EHS) to track exposures and to take appropriate actions to maintain radiation doses As Low As Reasonably Achievable (ALARA). Dosimeters measure external radiation dose and do not provide protection against radiation exposure.

Do not work with radioactive material or radiation producing devices without wearing the proper and required dosimetry!

Annual Radiation Dose Limits

Regulatory dose limits for an occupational radiation worker are as follows:

- Whole Body = 5,000 mrem/yr
- Lens of Eye = 15,000 mrem/yr
- Skin/Extremity = 50,000 mrem/yr
- Embryo/Fetus = 500 mrem/pregnancy

In accordance with UNL's ALARA program, exposures measured with dosimeters are reviewed by the Radiation Safety Office staff on a routine basis. The Radiation Safety Office staff will contact all individuals whose quarterly dose exceeds 3% of the annual limit.

Personnel Requiring Dosimetry

Most radiation workers are required to wear dosimeters; exceptions include radiation workers working with the following: XPS (X-Ray Photoelectron Spectroscopy), Electron Microscopes and open sources of only H-3, C-14, P-33, Fe-55, Ca-45 and S-35. Radiation workers required to wear dosimetry are as follows:

- *Open Source Users:* radiation workers handling P-32, I-125, Se-75, Fe-59, Na-22, Cr-51, Cl-36, and Uranium are required to wear ring and whole-body dosimeters.
- *Sealed Source Users:* radiation workers handling sealed sources are typically required to wear whole-body and ring dosimeters. Dosimetry requirements for sealed source users will be determined by the Radiation Safety Officer on a case by case basis.
- *Neutron Gauge Users:* radiation workers operating neutron gauges are required to wear whole-body dosimeters.
- *Analytical X-ray Users:* radiation workers operating analytical x-ray machines are required to wear ring and whole-body dosimeters.



- *Veterinary X-ray Users:* radiation workers operating veterinary x-ray machines are required to wear whole-body dosimeters.
- *Human Use (Diagnostic) X-ray Users:* radiation workers operating diagnostic x-ray machines are required to wear whole-body dosimeters.
- *DIOCLES Laser Facility Users:* radiation workers operating the lasers are required to wear whole-body dosimeters. Ring dosimeters may be required depending on the type of experiment being performed.
- *Neutron Generator Facility Users:* radiation workers operating the neutron generator are required to wear ring and whole-body dosimeters.

Receiving Dosimetry

- *Whole-Body and Ring Dosimeters:* Upon completion of appropriate radiation safety training, EHS will send dosimeters and training certificates to the designated department Badge Coordinator. Contact your department's administrative office or EHS for the name of your department's Badge Coordinator.
- *Fetal Dosimeters:* Women who become pregnant may choose to participate in the fetal dosimetry program. Contact your department's Badge Coordinator or EHS and complete a **Declaration of Pregnancy form**. EHS will send fetal dosimeters to the Badge Coordinator, or the requesting individual if needed upon receipt of this form.
- *Returning Radiation Workers:* Personnel with previously terminated dosimetry service should contact EHS to update appropriate training records and reactivate dosimetry.

Wearing Dosimetry

Dosimeters must be worn at all times when working with a radiation source. When not actively working with a radiation source, store dosimeters in a location that is protected from radiation exposure.

- *Whole-Body Dosimeter:* The whole-body dosimeter should be worn in the upper torso area between the waist and neck (such as on the collar, shirt pocket, or lab jacket).
- *Rings:* The ring dosimeter should be worn on the index, middle, or ring finger of the dominant hand (hand most used during work with radioactive materials). The ring should be turned so the label faces the source of radiation, and worn inside the gloves.
- *Fetal Dosimeter:* The fetal dosimeter should be worn on the abdomen to monitor radiation exposure to the fetus (such as on a waistband or the lower portion of a lab jacket).

Dosimetry Exchange

- *Whole Body and Ring Dosimeters:* Every three months (March, June, September, December), dosimeters must be returned to the department Badge Coordinator. At this time, new dosimeter(s) for the next quarter will be distributed.
- *Fetal Dosimeter:* Fetal dosimeters are exchanged monthly through the Badge Coordinator or the requesting individual.

Transferring Authorized Users

- *Non-Radioactive Researcher to Radioactive Material Authorized User:* Contact EHS to complete appropriate training requirements for work with radioactive isotopes.
- *Transfer between Radioactive Material Authorized Users:* Contact either departments' Badge Coordinator or EHS with the old and new Authorized User's information. This will allow appropriate dosimeters to be added or deactivated, personnel records to be transferred, and ensure receipt of future dosimeters.
- *Radioactive Material Authorized User to Non-Radioactive Researcher:* Notify the Badge Coordinator or EHS of the transfer and return all used and unused dosimeters. Inform the Badge Coordinator or EHS if you would like a Termination Report (Exposure History) sent, and indicate the forwarding address.

Terminating Dosimetry Service

Notify the department Badge Coordinator or EHS that dosimetry will no longer be needed and provide an effective date for termination. Return all used and unused dosimeters to the Badge Coordinator. Contact EHS when fetal dosimetry is no longer needed or required. If a Termination Report (Exposure History) is requested, a forwarding address is required.

Lost Dosimetry

For lost dosimetry, contact EHS immediately to obtain a replacement (ring, whole-body badge, or fetal dosimetry badge). ***Do not work with radioactive material or radiation producing devices without required dosimeters.***