X-Ray Regulatory Guide for Veterinary Facilities



STATE OF WISCONSIN

DEPARTMENT OF HEALTH SERVICES

Division of Public Health

Bureau of Environmental and Occupational Health

Radiation Protection Section

PO Box 2659

Madison, Wisconsin 53701

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# SAMPLE RADIATION SAFETY POLICY

All registrants are required to have a radiation safety program and a written radiation safety policy. This sample policy is to help a registrant include in the written safety policy with the minimum standards to meet Wis. Admin. Code ch. DHS 157 safety requirements. This is not an all-inclusive document. Additions and adjustments may need to be made to meet your current radiation uses.

## Changes in Registration

If there are changes in the registration for this facility, such as change of address, responsible party, etc., written notice must be sent to the Department of Health (DHS) within 30 days of the change. Change of ownership requires a new registration with full fees paid by the new owner. Addition of new equipment and/or the replacement/removal of old equipment also needs to be reported to ensure your annual registration fees are accurate. Changes to the registration information may be faxed to 608-267-4799 or mailed to Division of Public Health, Radiation Protection Section, PO Box 2659, Madison, WI 53701-2659. If you would like to send this electronically, please call 608-267-4782.

Current contact information for DHS is available at the following web address: <https://www.dhs.wisconsin.gov/radiation/xray/index.htm>

# OPERATING and SAFETY PROCEDURES

## Operating and Safety Procedures For Your Facility

This policy establishes procedures that will minimize radiation exposure to employees. The policy statements are provided to comply with regulations enforced by DHS Radiation Protection Section. The regulations require that each x-ray facility and all x-ray devices at that address be registered with DHS and pay annual renewal fees.

The registrant MUST designate a person responsible for oversight and annual review of these procedures. This person is often referred to as the Person-in-Control or the Radiation Safety Officer (RSO). This individual has the responsibility and authority for assuring safe radiation practices and serves as the contact person between this facility and DHS. All questions and concerns regarding radiation safety for this facility should be directed to the RSO.

## Posting Notices, Instructions, and Reports to Workers

Employees must be familiar with the "Notice to Employees" document, which needs to be posted in an employee accessible area.

The location of written operations and safety procedures and location of where the regulations can be accessed is to be written in the lined box at the top of the “Notice to Employees” sign.

The certificate of registration, issued annually at the time of registration renewal, the operating and safety procedures and any notices of violations involving radiological working conditions are located in/at the radiology department. Specify the area in your procedures. .

The practice is required to provide staff access to the regulations. Your rights and obligations as a radiation worker are found in § DHS 157.88. .

A copy of the Notice to Employees is available at our website <https://www.dhs.wisconsin.gov/radiation/index.htm> or by calling the Radiation Protection Section at 608-267-4782.

# OPERATOR SAFETY

## Training Requirements for X-Ray Machine Operators

All operators of x-ray machines must be trained:

1. To operate the equipment safely, i.e., adequate collimation, procedures for mobile/portable x-ray units.
2. In selection of proper technique factors (time, mA, mAs, or kVp).
3. To position the animal and equipment properly.
4. To process the image properly.
5. In the use of personal protective equipment (apron, gloves, thyroid collar, etc.).
6. In the use of fluoroscopic equipment (for detailed training in fluoroscopy see Page 11 of the [X-Ray Regulatory Guide, P-01639](https://www.dhs.wisconsin.gov/publications/p01639.docx), under “Use of Fluoroscopic Machines”).

All operators shall acknowledge receipt of this training by signing an Operation and Safety Procedure Training Verification; the signed training form will be maintained in or nearby the location of the x-ray device. (Operation and Safety Procedure Training Verification wording can be found in Appendix B of the X-ray Regulatory Guide).

Training documentation will include a copy of the operating and safety procedures, as well as specific equipment-use training, date(s) of the training, a list and signatures of staff in attendance, and the qualifications of the person providing the instruction. (Training Documentation wording can be found in Appendix C of the X-ray Regulatory Guide).

X-ray machine operators need to be trained on each piece of x-ray equipment they will be using. Although they may have used similar equipment in the past, each unit could have unique operating characteristics.

## Individual Radiation Monitoring Requirements (DOSIMETRY)

Any adult who is likely to receive a dose from occupational exposure to radiation in excess of 5 mSv (500 millirem) in a year must use an individual monitoring device. In a medical/clinic setting where the doctor/owner is the only x-ray machine operator, monitoring devices are not required. Any associate doctors and/or employees who are likely to receive a dose from occupational exposure to radiation in excess of 5 mSv (500 millirem) in a year must use an individual monitoring device.

Your procedures should indicate whether the site ***has or has not*** issued dosimetry to staff.

## Use of Protective Devices

1. Use protective devices, such as lead aprons, gloves, and shields, to reduce exposure to radiation and keep radiation exposure as low as reasonably achievable (ALARA). All protective devices for veterinary personnel must be .5 mm lead equivalent. Gloves or mittens must completely surround the hand. Hand flaps that cover the back of the hand do not provide sufficient protection—because they do not stop the radiation scattering back from the cassette or table from exposing the palm area—and shall not be used. **DO NOT USE LEADED PROTECTIVE DEVICES TO RESTRAIN ANIMALS.** Other devices, such as sand bags, should be used for restraining animals. An animal’s teeth and claws can damage leaded gloves or aprons.
2. Protective devices must be used when it is necessary for an individual to hold an animal or remain in the room.
3. If fluoroscopic procedures are being performed, protective devices shall be utilized; lead drapes and hinged sliding panels shall be in place to reduce the scatter (secondary) radiation to the operator.
4. Protective devices, gloves, aprons, and thyroid collars are stored in the proximity of the x-ray device. Do not fold.
5. Protective devices must be radiographically or fluoroscopically evaluated every two years for defects. The veterinarian or RSO must review these images. These devices should be checked annually for defects such as holes, cracks, or tears. This check can be done by visually inspecting or feeling the protective devices or by x-raying these items. If a defect is found at the time of either the radiographic or visual check or on any other occasion, notify the RSO and remove the device from service until it can be repaired or replaced. A record will be kept of these checks and be made available to an inspector. See Appendix E.
6. The exposure (switch) must allow the person making the exposure to be able to stand at least 2 meters (6.5 feet) away from the table (source of radiation), if they are not restraining the animal.

## Holding of Animals and/or Image Receptor

**DO NOT HOLD THE X-RAY TUBE HEAD DURING EXPOSURES! Mechanical tube head support must be provided at all times, even with portable x-ray equipment.**

* 1. Mechanical restraints shall be used to restrict movement of the animal unless it would interfere with exam of the animal. Sedation can be used when the veterinarian determines it is appropriate.
  2. If it becomes necessary for an individual to hold an animal or image receptor, the holder shall not be pregnant. They must wear protective devices (aprons, gloves, and thyroid collars) and keep unprotected body parts out of the direct beam. If the facility supplies staff with personal dosimetry, be sure it is properly worn.
  3. No single individual may be regularly utilized to hold or support animals during an exposure.
  4. Additional requirements, procedures, or preferences for holding animals and image receptors for the facility should be listed in your procedures; and must include all training requirements.

## Radiation Incident or Overexposure

If any person suspects that there has been an excessive exposure or a radiation incident (i.e., exposing yourself or a coworker to the direct beam), immediately notify the RSO who will then notify DHS by phone 608-267-4787 and by fax 608-267-4799. DHS will investigate the alleged incident.

# SAFE OPERATION OF IMAGING EQUIPMENT

## X-Ray Machine Operator Position during an Exposure

* 1. The operator must be able to see every entrance to the room or area surrounding the x-ray unit from the operator position. Entrances can be monitored directly, with mirrors or interlocks.
  2. During the exposure, the operator must be positioned so that their exposure is as low as reasonably achievable (ALARA). Lead aprons, gloves, or other shielding is to be used.
  3. If possible, only one person should be near the animal during the exam. Anyone else should be at least 2 meters (6.5 feet) away.
  4. Foot-operated exposure switches are acceptable and should be used by the person best able to determine the proper moment for the exposure. Foot switches shall be on a 2 meter (6.5 feet) cord so that the person making the exposure can be at least 2 meters away from the table, as required in DHS 157.79(3). If the person restraining the animal is operating the exposure switch, the switch may be next to the table.

## Use of a Technique Chart

* 1. Technique charts are required for systems with adjustable techniques, such as kV, time, and mA (x-ray tube current). A technique chart aids in reducing the exposure to the operator and patient by providing a standard technique based on animal size and type of study.
  2. Technique charts are displayed in the vicinity of the control panel of each x-ray machine.
  3. Some units have programmed techniques built into the control. If programmed techniques are no longer correct, written charts must be created and used or the programmed techniques must be updated by your service vendor or unit manufacturer.
  4. Any technique found on a chart or within the internal pre-sets that is not accurate needs to be discussed with the RSO.
  5. When switching from analog film to digital imaging, be sure to post new technique charts. Exposure factors needed to produce a diagnostic image are often reduced for digital imaging.

## X-Ray Beam Restriction and Alignment

* 1. To meet the intent of ALARA, the useful x-ray beam shall be restricted to the area of clinical interest. Use the centering and beam-limiting devices (collimator) provided on the x-ray machine.
  2. If the unit has automatic collimation and the system fails, the RSO must be notified immediately and have the unit repaired. Automatic collimators must continue to function unless repair parts are no longer available.
  3. Collimators are **NEVER** allowed to be open wider than the image receptor.
  4. Units that use apertures for collimation must have a means to center the x-ray beam to the image receptor or the area of clinical interest.

## Use of Mobile or Portable and Hand-Held Machines

* 1. DHS 157 defines mobile x-ray equipment as mounted on a permanent base with wheels and/or casters for moving while completely assembled; portable x-ray equipment is defined as hand-carried.
  2. The x-ray machine operator must be positioned so that his/her exposure to scatter radiation is as low as reasonably achievable (ALARA). \*The operator shall remain 2 meters (6.5 feet) or more away from the tube and patient unless behind a barrier. The operator should never be in line with the direct beam.
  3. If the x-ray machine operator must be closer than 2 meters (6.5 feet) from the patient or tube, the operator must wear a lead apron.
  4. This facility must list the portable and hand-held machines in their procedures
  5. Additional precautions when using these devices in our practice (i.e., holding of animals and position of staff as well as safety training specific to hand-held devices) should be listed in your procedures; and must include all training requirements.