Chapter 10
Veterinary Use of X-Ray Systems

The Illinois Emergency Management Agency (IEMA) regulations for use of x-ray machines in veterinary medicine are very similar to those for diagnostic radiology.

10.1 General Requirements and Administrative Controls

The requirements described in Chapter 9, Section 9.2, *General Requirements and Administrative Controls*, apply to all veterinary uses of x-ray machines. Section 9.2 includes subsections on prohibited uses, personnel monitoring, training requirements, general equipment and operation requirements. Accreditation requirements do not apply since x rays will not be administered to humans.

10.2 Specific Requirements

Section 360.110 of the IEMA regulations, *Veterinary Radiographic Systems*, makes the following additional requirements.

**Beam Limitation** - The useful beam of the x-ray unit must be limited to the area of clinical interest. The size of the image receptor used for each radiographic projection must be consistent with the objectives of the examination.

**Field Size and SID Indicators** - Veterinary radiographic systems must be provided with a means to accurately align the center of the x-ray field with the center of the image receptor and to limit the useful beam to the area of clinical interest. They must also be equipped with an indicator that accurately displays the distance in centimeters or inches between the x-ray tube (the source) and the image receptor (film or photomultiplier tube). This distance is referred to as the source-to-image distance, or SID.

The following means may be used to limit the useful beam to the area of clinical interest:

- An adjustable collimator with an accurately aligned field defining light;
- An assortment of removable, fixed aperture, beam limiting devices that accurately align the beam, that are clearly and permanently marked in centimeters or inches to indicate the image receptor size and SID for which it is designed; or
- An accurately aligned beam-limiting device, having multiple fixed apertures that is clearly and permanently marked, in centimeters or inches, that indicates the image receptor size, and SID for which each aperture is designed and shall indicate which aperture is in position for use.

Equipment that has an inaccurately aligned x-ray beam, inaccurate field size or SID indicator or markings, field defining lights, etc. should be promptly repaired.

**Arrangement of Exposure Controls** - The exposure control switch must be arranged so the operator can be at least 6 feet away from the animal, the x-ray tube, and the useful beam.
Radiation Exposure Control Devices - The exposure switch must be of the dead-man variety. The system must be equipped with means to terminate the x-ray exposure at a preset time interval, preset product of current and time, preset number of pulses, or preset radiation exposure to the image receptor. It shall not be possible to make an exposure when the timer is set to zero or the off position if either position is provided.

Veterinary Fluoroscopy Systems - All of the requirements described in Chapter 9, Section 9.7, Fluoroscopic Systems, apply to veterinary use of fluoroscopy systems.

Veterinary CT Systems - All of the requirements described in Chapter 9, Section 9.8, CT Systems, apply to veterinary use of CT systems. Requirements pertaining to aural communications do not apply unless a human is used to hold an animal.

Therapy Systems - All of the requirements described in Chapter 9, Section 9.10, Radiation Safety Requirements for Use of Therapeutic Equipment, apply to veterinary use of therapy systems. Requirements pertaining to aural communications do not apply unless a human is used to hold an animal.

Additional Operational Requirements - The following additional requirements are made by IEMA for veterinary uses of x-ray systems:

- All individuals whose presence is required during an x-ray examination shall be protected from scatter radiation by protective aprons or gowns of not less than 0.25 millimeter lead equivalent or whole body protective barriers;
- All exams and retakes shall be ordered by the veterinarian;
- No individual, other than the operator, shall be in the x-ray room or area while exposures are being made unless such individual's assistance is required;
- Unless required to restrain an animal, the operator shall stand at least 6 feet away from the useful beam and the animal during radiographic exposures;
- When an animal must be held in position during radiography, mechanical supporting or restraining devices shall be used when technique permits;
- When a person is required to hold an animal during a radiographic procedure, the individual shall be protected with appropriate shielding devices, such as protective gloves and aprons, and the person shall be so positioned that no part of his or her body except hands and arms will be struck by the useful beam. The Radiation Safety Section (RSS) recommends rotation of personnel so that any one individual does not receive an excessive exposure; and
- Dosimeters shall be worn outside the apron at collar level.