4732.0875 VETERINARY MEDICAL RADIOGRAPHIC SYSTEMS.

Subpart 1. **Applicability.**

A. This part applies to x-ray systems used for diagnostic veterinary medicine radiography. The registrant must meet the requirements in this part and other pertinent requirements in this chapter, and the equipment must meet:

(1) nationally recognized standards;

(2) the manufacturer's specifications; or

(3) part 4732.1100.

B. For new installations and remodeling occurring 90 days after November 5, 2007, the shielding requirements in parts 4732.0355 and 4732.0360 must be met.

Subp. 2. **Beam limitation.** The useful beam must be limited to the area of clinical interest.

A. Means must be provided to limit the x-ray field in the plane of the image receptor so the field does not exceed each dimension of the image receptor by more than two percent of the SID when the axis of the x-ray beam is perpendicular to the place of the image receptor.

B. Means must be provided to align the center of the x-ray field with the center of the image receptor to within two percent of the SID, or means must be provided to align the x-ray field so the x-ray field at the plane of the image receptor does not extend beyond any edge of the image receptor.

C. The requirements of items A and B may be met with either:

(1) an assortment of removable, fixed-aperture, beam-limiting devices sufficient to meet the requirement for each combination of image receptor size and SID for which the system is designed, with each device having clear and permanent markings to indicate the image receptor size and SID for which it is designed; or the collimator must be labeled to indicate the field size and the SID for which it is designed; or

(2) a beam-limiting device having multiple fixed apertures sufficient to meet the requirement for each combination of image receptor size and SID for which the system is designed. Permanent, clearly legible markings must indicate the image receptor size and SID for which each aperture is designed and must indicate which aperture is in position for use.

Subp. 3. **X-ray control console.**

A. All x-ray control console panel indicator lights must be operational.

B. The x-ray control console must provide visual indication observable from the operator's protected position whenever x-rays are produced.

C. The x-ray control console must provide a signal audible to the operator when the exposure has terminated.

Subp. 4. **Beam quality half-value layer.** The requirements for half-value layer found in part 4732.0800, subpart 6, must be met.

Subp. 5. **Operating procedures.** The registrant must provide operating procedures to ensure that dose limits in parts 4732.0400 to 4732.0430 are not exceeded.

A. The operator must not stand in the path of the useful beam during radiographic procedures.

B. No individual other than the operator can be in the radiographic room while exposures are being made unless the individual's assistance is required.

C. When an animal must be held by an individual during radiography, that individual must wear protective aprons and gloves of at least 0.5 millimeters lead equivalency. The individual must be positioned so that no part of the body, protected or unprotected, will be struck by the useful beam.

D. A mechanical cassette holding device must be used for horizontal beam x-rays whenever possible.

Subp. 6. **Additional requirements for fluoroscopic systems in veterinary facilities.** All fluoroscopic x-ray systems must be image intensified and meet the requirements in items A to J:

A. The fluoroscopic imaging assembly must be provided with a primary protective barrier that intercepts the entire cross section of the useful beam at any SID.

B. The x-ray tube used for fluoroscopy must not produce x-rays unless the barrier is in position to intercept the entire useful beam.

C. For fluoroscopic systems with or without a spot film device, the length or the width of the x-ray field in the plane of the image receptor must not exceed the length or width of the visible area of the image receptor by more than three percent of the SID.

D. For spot-film beam limitation, the x-ray field size in the plane of the film must be adjustable to a size smaller than the selected portion of the film. The minimum field size at the greatest SID must be equal to, or less than, five centimeters by five centimeters.

E. The center of the x-ray field in the plane of the film must be aligned with the center of the selected portion of the film to within two percent of the SID.

F. Fluoroscopic equipment that is provided with automatic exposure rate control must not be operable at any combination of kVp and mA which will result in an exposure

rate in excess of ten roentgens (2.6 mC/kg) per minute at the point where the center of the useful beam enters the patient, except:

(1) during recording of fluoroscopic images; or

(2) when an optional high-level control is activated.

G. Fluoroscopic equipment that is not provided with automatic exposure rate control must not be operable at any combination of kVp or mA which will result in an exposure rate in excess of five roentgens (1.3 mC/kg) per minute at the point where the center of the useful beam enters the patient, except:

(1) during recording of fluoroscopic images; or

(2) when an optional high-level control is activated.

H. If a high-level control is available, a continuous signal audible to the fluoroscopist must indicate that the high-level control is being employed.

I. X-ray production in the fluoroscopic mode must be controlled by a device that requires continuous pressure by the fluoroscopist for the entire time of any exposure.

J. The source-to-skin distance must not be less than:

(1) 15 inches (38 centimeters) on stationary fluoroscopes;

(2) 14 inches (35.5 centimeters) on stationary fluoroscopes manufactured prior to August 1, 1974;

(3) 11.8 inches (30 centimeters) on all portable fluoroscopes; and

(4) 7.9 inches (20 centimeters) for image intensified fluoroscopes used for specific surgical applications.

Subp. 7. **Additional requirements for therapeutic systems in veterinary medical facilities.** Veterinary therapeutic equipment must meet the specifications in items A to C.

A. When the x-ray tube is operated at its maximum rated mA for the maximum kV, the leakage air kerma rate must not exceed the following value:

(1) 150 kV systems: the leakage air kerma rate measured at any position five centimeters from the tube housing assembly must not exceed 100 mrad (1 mGy) in any one hour;

(2) systems greater than 150 kV and less than 500 kV systems: the leakage air kerma rate measured at a distance of one meter from the target in any direction must not exceed one rad (1 cGy) in any one hour.

B. A suitable irradiation timer control device must be provided to terminate the irradiation after a preset time interval.

C. The control panel, in addition to the displays, must have an indication of whether electrical power is available at the control panel and if activation of the x-ray tube is possible; and:

(1) an indication of whether x-rays are being produced;

(2) a means for indicating x-ray kVp and mA;

(3) the means for terminating an exposure at any time; and

(4) a locking device that will prevent unauthorized use of the therapeutic radiation machine.

Subp. 8. **Additional requirements for dental intraoral systems in veterinary medical facilities.** Veterinary dental intraoral equipment must:

A. be provided with a position-indicating device to limit source-to-skin distance to not less than 7.1 inches (18 centimeters);

B. employ collimation to limit the x-ray field such that:

(1) if the minimum source-to-skin distance is 7.1 inches (18 centimeters) or more, the x-ray field, at the minimum, must be containable in a circle having a diameter of no more than 2.76 inches (seven centimeters); or

(2) with rectangular position-indicating devices, the longer side must not exceed two inches (5.1 centimeters); and

C. be such that the tube housing and position-indicating device must be stable before and during the exposure. The tube housing cannot be hand-held during an exposure.

Subp. 9. **Records.** Veterinary facilities must maintain records according to part 4732.0330.

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