

UNIVERSITY OF HOUSTON

Radiation Safety Manual

Radiation Safety Requirements for X-ray Machines in Veterinary Medicine

These procedures are adapted from the regulations in Title 25 of the Texas Administration Code (TAC), Chapter 289, Section 233. All forms can be found in the Radiation Safety Manual located via the Internet at <http://www.uh.edu/plantops/ehrm>.

No radiation may be deliberately applied to animals except by or under the supervision of a veterinarian authorized by the Texas Board of Veterinary Medical Examiners to engage in veterinary medicine. Radiation Machines shall be secured from unauthorized removal. Devices and/or administrative procedures shall be used to prevent unauthorized use of radiation machines.

A technique chart relevant to the particular radiation machine shall be provided in the vicinity of the control panel and used by all operators. Each registrant shall have and implement written operating and safety procedures. These procedures shall be made available to each individual operating a radiation machine including any restrictions of the operating technique required for the safe operation of the particular x-ray system. Written operating and safety procedures for the Veterinary Facility are based on the Texas Department of State Health Services' Regulatory Guide 4.5.

Except as otherwise exempted, all individuals who are associated with the operation of a radiation machine are subject to the occupational dose limits of this title regarding dose limits to individuals, and the personnel monitoring requirements of this title. Protective devices shall be utilized when required. Protective devices shall be made of no less than 0.25 mm lead equivalent material. Protective devices including aprons, gloves, and shields shall be checked annually for defects, such as holes, cracks, and tears. These checks may be performed by the registrant by visual or tactile means, or x-ray imaging. If a defect is found, protective devices shall be replaced or removed from service until repaired. A record of this test shall be made and maintained by the registrant for inspection by the agency.

No individual other than the animal, operator, and ancillary personnel shall be in the x-ray room or area while exposures are being made unless such individual's assistance is required. When an animal or image receptor must be held in position

during radiography, mechanical supporting or restraining devices shall be used when the exam permits. If an animal or image receptor must be held by an individual during an exposure, that individual shall be protected with appropriate shielding devices. The registrant's written operating and safety procedures shall include a list of circumstances in which mechanical holding devices cannot be routinely utilized; and a procedure for selecting an individual to hold or support the animal or image receptor.

The operator position during the exposure shall be such that the operator's exposure is as low as reasonably achievable (ALARA) and the operator is a minimum of six feet from the source of radiation or protected by an apron, gloves, or other shielding having a minimum of 0.25 mm lead equivalent material. In no case shall an individual hold the tube or tube housing assembly supports during any radiographic exposure.

The technique factors to be used during an exposure shall be indicated before the exposure begins except when automatic exposure controls are used, in which case the technique factors that are set prior to the exposure shall be indicated. On equipment having fixed technique factors there must be permanent markings. The x-ray control shall provide visual indication of the production of x-rays. The indicated technique factors shall be accurate to meet manufacturer's specifications. If these specifications are not available from the manufacturer, the factors shall be accurate within plus or minus 10% of the indicated setting.

Films shall be developed in accordance with the time-temperature relationships recommended by the film manufacturer. The specified developer temperature for automatic processing and the time-temperature chart for manual processing shall be posted in the darkroom. If the registrant determines that an alternate time-temperature relationship is more appropriate for a specific facility, that time-temperature relationship shall be documented and posted.

Chemicals shall be replaced according to the chemical manufacturer's or supplier's recommendations or at an interval not to exceed three months. Darkroom light tests shall be performed and any light leaks corrected at intervals not to exceed six months. Lighting in the film processing/loading area shall be maintained with the filter, bulb wattage, and distances recommended by the film manufacturer for that film emulsion or with products that provide an equivalent level of protection against fogging. Corrections or repairs of the light leaks or other deficiencies shall be initiated within 72 hours of discovery and completed no longer than 15 days

from detection of deficiency unless authorized by the agency. Records of the correction or repairs shall include the date and initials of the individual performing these functions and shall be maintained for inspection by the agency.

Documentation that the registrant is following manufacturer's recommendations shall be maintained at the site where performed.

A radiographic x-ray equipment performance evaluation shall be performed by a contract Medical Physicist annually. Mechanical maintenance will be performed by a vendor as required to maintain compliance. Quality assurance tests will be performed by authorized personnel and vendors as required to maintain compliance. In addition, Radiation Safety personnel will periodically perform reviews to assure compliance.