

25 TEXAS ADMINISTRATIVE CODE

§289.233

RADIATION CONTROL REGULATIONS FOR RADIATION MACHINES USED IN VETERINARY MEDICINE

TEXAS REGULATIONS FOR CONTROL OF RADIATION

(revisions effective October 12, 2008 are show as shaded text)

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§289.233 Radiation Control Regulations for Radiation Machines Used in Veterinary Medicine.

(a) Purpose. This section establishes the following.

(1) Fees for certificates of registration for veterinary facilities and provisions for their payment.

(2) Requirements for the registration of persons using radiation machines. No person shall use radiation machines except as authorized in a certificate of registration issued by the agency in accordance with the requirements of this section. A person who receives, possesses, uses, owns, or acquires radiation machines prior to receiving a certificate of registration is subject to the requirements of this chapter.

(3) Requirements intended to control the receipt, possession, use, and transfer of radiation machines by any person so the total dose to an individual, including doses resulting from all radiation machines other than background radiation, does not exceed the standards for protection against radiation prescribed in this section. However, nothing in this section shall be construed as limiting actions that may be necessary to protect health and safety in an emergency.

(4) Requirements for the use of radiation machines used in veterinary medicine. The registrant shall assure that the requirements of this section are met in the operation of such radiation machines.

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SUMMARY OF VETERINARIAN RULE

These rules are for veterinarians who use x-ray machines.

This rule explains:

- **how you register your x-ray machine**
- **how to safely use your x-ray machine**
- **how to keep your x-ray machine in safe working condition**
- **what records to keep**
- **the rights of your employees who operate the x-ray machine**
- **actions the agency can take**

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(5) Specific record keeping requirements and general provisions for records and reports.

(6) Requirements for providing notices to employees and instructions and options available to such individuals in connection with agency inspections of registrants to ascertain compliance with the provisions of the Texas Radiation Control Act (Act), Health and Safety Code, Chapter 401, and requirements of this chapter, orders, and certificates of registration issued thereunder regarding radiological working conditions.

(7) Governing of the following in accordance with the Act, Health and Safety Code, Chapter 401; the Texas Administrative Procedure Act, Texas Government Code, Chapter 2001; Title 1, Texas Administrative Code (TAC), Chapter 155; and the Formal Hearing Procedures, §§1.21, 1.23, 1.25, and 1.27 of this title.

(A) proceedings for the granting, denying, renewing, transferring, amending, suspending, revoking, or annulling of a certificate of registration;

(B) determining compliance with or granting of exemptions from requirements of this chapter, an order, or a condition of certificate of registration;

(C) assessing administrative penalties; and

(D) determining propriety of other agency orders.

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(b) Scope.

(1) Except as specifically provided in other sections of this chapter, this section applies to persons who receive, possess, use, or transfer radiation machines used in veterinary medicine. The dose limits in this section do not apply to doses due to background radiation or voluntary participation in medical research programs. 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.

(2) Registrants who are also registered by the agency to receive, possess, acquire, transfer, or use class IIIb and class IV lasers in veterinary medicine shall also comply with the requirements of §289.301 of this title (relating to Registration of Radiation Safety Requirements for Lasers).

(3) Registrants who are also registered by the agency to receive, possess, transfer, or use accelerators, therapeutic radiation machines, and radiation therapy simulation systems for use in veterinary medicine shall also comply with the requirements of §289.229 of this title (relating to Radiation Safety Requirements for Accelerators, Therapeutic Radiation Machines, and Simulators).

These are the only radiation rules that apply to veterinarians using x-ray machines.

Veterinarians who use lasers must follow additional rules found in another section.

Veterinarians who use accelerators, therapeutic radiation machines, and radiation therapy simulation systems must follow additional rules found in another section.

§289.233(b)(4)

(4) Registrants who are also specifically licensed by the agency to receive, possess, use, and transfer radioactive materials must also comply with the applicable requirements of §289.201 of this title (relating to General Provisions for Radioactive Material), §289.202 of this title (relating to Standards for Protection Against Radiation from Radioactive Materials), §289.252 of this title (relating to Licensing of Radioactive Material), §289.256 of this title (relating to Medical and Veterinary Use of Radioactive Material), and §289.257 of this title (relating to Packaging and Transportation of Radioactive Material).

(5) The agency may, by requirements in this chapter, an order, or a condition of certificate of registration, impose upon any registrant such requirements in addition to those established in this chapter as it deems appropriate or necessary to minimize danger to public health and safety or property or the environment.

(c) Definitions. The following words and terms when used in this section shall have the following meaning, unless the context clearly indicates otherwise.

(1) Absorbed dose--The energy imparted by ionizing radiation per unit mass of irradiated material. The units of absorbed dose are the gray (Gy) and the rad.

(2) Accessible surface--The external surface of the enclosure or housing provided by the manufacturer.

(3) Act--Texas Radiation Control Act, Health and Safety Code, Chapter 401.

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Veterinarians who also use radioactive materials must follow additional rules found in another section.

The agency may add requirements if necessary to protect public health and safety or property or the environment.

The definitions are self-explanatory.

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(4) Administrative Law Judge (ALJ)--Administrative law judge from the State Office of Administrative Hearings.

(5) Administrative penalty--A monetary penalty assessed by the agency in accordance with the Act, Health and Safety Code, §401.384, to emphasize the need for lasting remedial action and to deter future violations.

(6) Adult--An individual 18 or more years of age.

(7) Agency--The **Department of State Health Services** or its successor.

(8) Agreement State--Any state with which the United States Nuclear Regulatory Commission (NRC) has entered into an effective agreement under Section 274b. of the Atomic Energy Act of 1954, as amended (73 Stat. 689).

(9) As low as is reasonably achievable (ALARA)--Making every reasonable effort to maintain exposures to radiation as far below the dose limits in this chapter as is practical, consistent with the purpose for which the registered activity is undertaken, taking into account the state of technology, the economics of improvements in relation to the state of technology, the economics of improvements in relation to benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to utilization of ionizing radiation and radiation machines in the public interest.

(10) Attenuate--To reduce the exposure rate upon passage of radiation through matter.

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(11) Attenuation block--A block or stack, having dimensions 20 centimeters (cm) by 20 cm by 3.8 cm, of type 1100 aluminum alloy or other materials having equivalent attenuation. The nominal chemical composition of type 1100 aluminum alloy is 99% minimum aluminum, 0.12% copper.

(12) Background radiation--Radiation from cosmic sources; non-technologically enhanced naturally occurring radioactive material, including radon, except as a decay product of source or special nuclear material, and including global fallout as it exists in the environment from the testing of nuclear explosive devices or from past nuclear accidents, such as Chernobyl, that contribute to background radiation and are not under the control of the registrant. "Background radiation" does not include radiation from radiation machines regulated by the agency.

(13) Barrier--(See definition for protective barrier.)

(14) Beam axis--A line from the source through the centers of the x-ray fields.

(15) Beam-limiting device--A device that provides a means to restrict the dimensions of the x-ray field.

(16) Beam quality (diagnostic x-ray)--A term that describes the penetrating power of the x-ray beam. This is identified numerically by half-value layer and is influenced by kilovolt peak (kVp) and filtration.

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(17) Certificate of registration--A form of permission given by the agency to an applicant who has met the requirements for registration set out in the Act and this chapter.

(18) Coefficient of variation or C--The ratio of the standard deviation to the mean value of a population of observations. It is estimated using the following equation:

$$C = \frac{s}{\bar{X}} = \frac{1}{\bar{X}} \left[\sum_{i=1}^n \frac{(X_i - \bar{X})^2}{n-1} \right]^{1/2}$$

where : s = estimated standard deviation of the population

\bar{X} = mean value of observations in sample

X_i = ith observation in sample

n = number of observations in sample

(19) Collective dose--The sum of the individual doses received in a given period of time by a specified population from exposure to a specified source of radiation.

(20) Commissioner--The Commissioner of the Department of State Health Services.

(21) Computed tomography (CT)--The production of a tomogram by the acquisition and computer processing of x-ray transmission data.

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(22) Control panel--The part of the radiation machine control upon which are mounted the switches, knobs, push buttons, and other hardware necessary for manually setting the technique factors.

(23) CT conditions of operation--All selectable parameters governing the operation of a CT x-ray system including, but not limited to, nominal tomographic section thickness, filtration, and the technique factors as defined in this subsection.

(24) CT gantry--The tube housing assemblies, beam-limiting devices, detectors, and the supporting structures and frames that hold these components.

(25) Declared pregnant woman--A woman who has voluntarily informed the registrant, in writing, of her pregnancy and the estimated date of conception. The declaration remains in effect until the declared pregnant woman voluntarily withdraws the declaration in writing or is no longer pregnant.

(26) Deep dose equivalent (DDE), that applies to external whole body exposure--The DE at a tissue depth of 1 centimeter (cm) (1,000 milligrams per square centimeter (mg/cm^2)).

(27) Diagnostic source assembly--The tube housing assembly with a beam-limiting device attached.

(28) Diagnostic x-ray system--An x-ray system designed for irradiation of any part of any animal for the purpose of diagnosis or visualization.

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(29) Director--The director of the radiation control program under the agency's jurisdiction.

(30) Dose--For external exposure to x-ray radiation from radiation machines, a generic term that means absorbed dose, DE, or total effective dose equivalent. For purposes of this chapter, "radiation dose" is an equivalent term.

(31) Dose equivalent (DE)--The product of the absorbed dose in tissue, quality factor, and all other necessary modifying factors at the location of interest. The units of DE are the sievert (Sv) and rem.

(32) Dose limits--The permissible upper bounds of radiation doses established in accordance with this chapter. For purposes of this chapter, "limits" is an equivalent term.

(33) Embryo/fetus--The developing human organism from conception until the time of birth.

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(34) Exposure--The quotient of dQ by dm where " dQ " is the absolute value of the total charge of the ions of one sign produced in air when all the electrons (negatrons and positrons) liberated by photons in a volume element of air having mass " dm " are completely stopped in air. The SI unit of exposure is the coulomb per kilogram (C/kg). The roentgen is the special unit of exposure. For purposes of this chapter, this term is used as a noun.

(35) Exposure rate--The exposure per unit of time.

(36) External dose--That portion of the DE received from any source of radiation outside the body.

(37) Extremity--Hand, elbow, arm below the elbow, foot, knee, and leg below the knee. The arm above the elbow and the leg above the knee are considered part of the whole body.

(38) Field emission equipment--Equipment that uses an x-ray tube in which electron emission from the cathode is due solely to the action of an electric field.

(39) Field size--The dimensions along the major axes of an area in a plane perpendicular to the central axis of the beam at the normal treatment or examination source to image distance and defined by the intersection of the major axes and the 50% isodose line.

(40) Filter--Material placed in the useful beam to preferentially absorb selected radiation.

(41) Fluoroscopic imaging assembly--A subsystem in which x-ray photons produce a fluoroscopic image. It includes the image receptors such as the image intensifier and spot-film device, electrical interlocks, if any, and structural material providing linkage between the image receptor and diagnostic source assembly.

(42) Gray (Gy)--The SI unit of absorbed dose. One gray is equal to an absorbed dose of 1 joule per kilogram (J/kg) or 100 rad.

(43) Half-value layer (HVL)--The thickness of a specified material that attenuates the beam of radiation to an extent such that the exposure rate is reduced to one-half of its original value.

(44) Healing arts--Any system, treatment, operation, diagnosis, prescription, or practice for the ascertainment, cure, relief, palliation, adjustment, or correction of any human disease, ailment, deformity, injury, or unhealthy or abnormal physical or mental condition.

(45) Hearing--A proceeding to examine an application or other matter before the agency in order to adjudicate rights, duties, or privileges.

(46) High radiation area--An area, accessible to individuals, in which radiation levels from radiation machines external to the body could result in an individual receiving a DE in excess of 0.1 rem (1 millisievert (mSv)) in one hour at 30 cm from any source of radiation or from any surface that the radiation penetrates.

(47) Image intensifier--A device, installed in its housing, that instantaneously converts an x-ray pattern into a corresponding light image of higher energy density.

(48) Image receptor--Any device, such as a fluorescent screen or radiographic film, that transforms incident x-ray photons either into a visible image or into another form that can be made into a visible image by further transformations.

(49) Individual--Any human being.

(50) Individual monitoring--The assessment of DE to an individual by the use of:

(A) individual monitoring devices; or

(B) survey data.

(51) Individual monitoring devices--Devices designed to be worn by a single individual for the assessment of DE. For purposes of this chapter, "personnel dosimeter" and "dosimeter" are equivalent terms. Examples of individual monitoring devices include, but are not limited to, film badges, thermoluminescence dosimeters (TLDs), optically stimulated luminescence dosimeters (OSLs), pocket ionization chambers (pocket dosimeters), and electronic personal dosimeters.

(52) Informal conference--A meeting held by the agency with a person to discuss the following:

(A) safety, safeguards, or environmental problems;

(B) compliance with regulatory or registration condition requirements;

(C) proposed corrective measures including, but not limited to, schedules for implementation; and

(D) enforcement options available to the agency.

(53) Inspection--An official examination and/or observation including, but not limited to, records, tests, surveys, and monitoring to determine compliance with the Act and rules, orders, requirements, and conditions of the agency.

(54) Ionizing radiation--Any electromagnetic or particulate radiation capable of producing ions, directly or indirectly, in its passage through matter. Ionizing radiation includes gamma rays and x rays, alpha and beta particles, high speed electrons, neutrons, and other nuclear particles.

§289.233(c)(55)

(55) Irradiation--The exposure of matter to ionizing radiation.

(56) kV--Kilovolt.

(57) kVp--Kilovolt peak (See definition for peak tube potential).

(58) Lead equivalent--The thickness of lead affording the same attenuation, under specified conditions, as the material in question.

(59) Lens dose equivalent (LDE)--The external DE to the lens of the eye at a tissue depth of 0.3 cm (300 mg/cm²).

(60) Lost or missing radiation machine(s)--A radiation machine(s) whose location is unknown.

(61) mA--Milliampere.

(62) Machine-produced radiation--A stimulated emission of radiation from a manufactured product or device or component part of a manufactured product or device that has an electronic circuit that during operation can generate or emit a physical field of radiation.

(63) mAs--Milliampere-second.

(64) Member of the public--Any individual, except when that individual is receiving an occupational dose.

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(65) Minor--An individual less than 18 years of age.

(66) Mobile service operation--The provision of radiation machines and personnel at temporary sites for limited time periods. The radiation machines may be fixed inside a motorized vehicle or may be a portable radiation machine that may be removed from the vehicle and taken into a facility for use.

(67) Monitoring--The measurement of radiation and the use of the results of these measurements to evaluate potential exposures and doses. For purposes of this chapter, "radiation monitoring" and "radiation protection monitoring" are equivalent terms.

(68) Notice of violation--A written statement prepared by the agency of one or more alleged infringements of a legally binding requirement.

(69) Occupational dose--The dose received by an individual in the course of employment in which the individual's assigned duties involve exposure to sources of radiation from licensed/registered and unlicensed/unregistered sources of radiation, whether in the possession of the licensee/registrant or other person. Occupational dose does not include dose received from background radiation, from any medical administration the individual has received, from exposure to individuals administered radioactive material and released in accordance with this chapter, from voluntary participation in medical research programs, or as a member of the public.

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(70) Order--A specific directive contained in a legal document issued by the agency.

(71) Party--A person designated as such by the hearing examiner. A party may consist of the following:

(A) the agency; and

(B) an applicant, licensee, registrant, accredited mammography facility, or certified industrial radiographer.

(72) Peak tube potential--The maximum value of the potential difference in kilovolts across the x-ray tube during an exposure.

(73) Person--Any individual, corporation, partnership, firm, association, trust, estate, public or private institution, group, agency, local government, any other state or political subdivision or agency thereof, or any other legal entity, and any legal successor, representative, agent, or agency of the foregoing, other than the United States Nuclear Regulatory Commission (NRC) and other federal government agencies licensed or exempted by the NRC.

(74) Personnel monitoring equipment--(See definition for individual monitoring devices.)

(75) Phototimer--A method for controlling exposures to image receptors by the amount of radiation that reaches a radiation monitoring device. The radiation monitoring device is part of an electronic circuit that controls the duration of time the tube is activated (See definition for automatic exposure control.)

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(76) Portable x-ray equipment--(See definition for x-ray equipment.)

(77) Primary protective barrier--(See definition for protective barrier.)

(78) Protective apron--An apron made of radiation absorbing materials used to reduce radiation exposure.

(79) Protective barrier--A barrier of radiation absorbing materials used to reduce radiation exposure. The types of protective barriers are as follows:

(A) primary protective barrier--A barrier sufficient to attenuate the useful beam to the required degree; or

(B) secondary protective barrier--A barrier sufficient to attenuate the stray radiation to the required degree.

(80) Protective glove--A glove made of radiation absorbing materials used to reduce radiation exposure.

(81) Public dose--The dose received by a member of the public from exposure to sources of radiation released by a licensee or registrant, or to any other source of radiation under the control of a licensee/registrant. It does not include occupational dose or doses received from background radiation, from any medical administration the individual has received, from exposure to individuals administered radioactive material and released in accordance with this chapter, or from voluntary participation in medical research programs.

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(82) Rad--The special unit of absorbed dose. One rad is equal to an absorbed dose of 100 ergs per gram (erg/g) or 0.01 J/kg (0.01 gray).

(83) Radiation--One or more of the following:

(A) gamma and x rays; alpha and beta particles and other atomic or nuclear particles or rays;

(B) radiation emitted to energy density levels that could reasonably cause bodily harm from an electronic device; or

(C) sonic, ultrasonic, or infrasonic waves from any electronic device or resulting from the operation of an electronic circuit in an electronic device in the energy range to reasonably cause detectable bodily harm.

(84) Radiation area--Any area, accessible to individuals, in which radiation levels could result in an individual receiving a DE in excess of 0.005 rem (0.05 mSv) in one hour at 30 cm from the radiation machine or from any surface that the radiation penetrates.

(85) Radiation machine--Any device capable of producing ionizing radiation except those devices with radioactive material as the only source of radiation.

§289.233(c)(86)

(86) Radiation safety officer (RSO)--An individual who has a knowledge of and the authority and responsibility to apply appropriate radiation protection rules, standards, and practices, who must be specifically authorized on a certificate of registration, and who is the primary contact with the agency.

(87) Radiograph--An image receptor on which the image is created directly or indirectly by an x-ray exposure and results in a permanent record.

(88) Registrant--Any person issued a certificate of registration by the agency in accordance with the Act and this chapter.

(89) Regulation--(See definition for rule.)

(90) Rem--The special unit of any of the quantities expressed as DE. The DE in rem is equal to the absorbed dose in rad multiplied by the quality factor (1 rem = 0.01 sievert (Sv)).

(91) Remote inspection--An examination by the agency of information submitted by the registrant on a form provided by the agency.

(92) Research and development--Research and development is defined as:

(A) theoretical analysis, exploration, or experimentation; or

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(B) the extension of investigative findings and theories of a scientific or technical nature into practical application for experimental and demonstration purposes, including the experimental production and testing of models, devices, equipment, materials, and processes.

(93) Restricted area--An area, access to which is limited by the registrant for the purpose of protecting individuals against undue risks from exposure to radiation. Restricted area does not include areas used as residential quarters, but separate rooms in a residential building may be set apart as a restricted area.

(94) Roentgen (R)--The special unit of exposure. One roentgen (R) equals 2.58×10^{-4} C/kg of air. (See definition for exposure.)

(95) Rule--Any agency statement of general applicability that implements, interprets, or prescribes law or policy, or describes the procedure or practice requirements of an agency. The term includes the amendment or repeal of a prior section but does not include statements concerning only the internal management or organization of any agency and not affecting private rights or procedures. The word "rule" was formerly referred to as "regulation."

(96) Scan--The complete process of collecting x-ray transmission data for the production of a tomogram. Data can be collected simultaneously during a single scan for the production of one or more tomograms.

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§289.233(c)(97)

(97) Scan time--The period of time between the beginning and end of x-ray transmission data accumulation for a single scan.

(98) Scattered radiation--Radiation that has been deviated in direction during passage through matter.

(99) Secondary protective barrier--(See definition for protective barrier.)

(100) Severity level--A classification of violations based on relative seriousness of each violation and the significance of the effect of the violation on the occupational or public health or safety or the environment.

(101) Shallow dose equivalent (SDE)--The DE at a tissue depth of 0.007 cm (7 mg/cm^2) that applies to the external exposure of the skin of the whole body or the skin of an extremity.

(102) Shutter--A device attached to the tube housing assembly that can totally intercept the useful beam and that has a lead equivalency not less than that of the tube housing assembly.

(103) SI--The abbreviation for the International System of Units.

(104) Sievert (Sv)--The SI unit of any of the quantities expressed as DE. The DE in sievert is equal to the absorbed dose in gray multiplied by the quality factor (1 Sv = 100 rem.)

(105) Source--The focal spot of the x-ray tube.

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§289.233(c)(106)

(106) Source of radiation--Any radioactive material, or any device or equipment emitting or capable of producing radiation.

(107) Source-to-image receptor distance (SID)--The distance from the source to the center of the input surface of the image receptor.

(108) Source-to-skin distance (SSD)--The distance from the source to the skin of the patient.

(109) Special units--The conventional units historically used by registrants, for example, rad (absorbed dose), and rem (DE).

(110) Spot film--A radiograph that is made during a fluoroscopic examination to permanently record conditions that exist during that fluoroscopic procedure.

(111) Stationary x-ray equipment--(See definition for x-ray equipment.)

(112) Stray radiation--The sum of leakage and scattered radiation.

(113) Supervision--The delegating of the task of applying radiation in accordance with this section to persons who perform tasks under the veterinarian's control. The veterinarian assumes full responsibility for these tasks and shall assure that the tasks will be administered correctly.

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§289.233(c)(114)

(114) Survey--An evaluation of the radiological conditions and potential hazards incident to the production, use, transfer, disposal, and/or presence of radiation machines. When appropriate, such survey includes, but is not limited to, tests, physical examination of location of equipment, measurements of levels of radiation present, and evaluation of administrative and/or engineered controls.

(115) Technique chart--A chart that provides all necessary generator control settings and geometry needed to make clinical radiographs when the radiography system is in manual mode.

(116) Technique factors--The conditions of operation that are specified as follows:

(A) for capacitor energy storage equipment, peak tube potential in kV and quantity of charge in mAs;

(B) for field emission equipment rated for pulsed operation, peak tube potential in kV and number of x-ray pulses;

(C) for CT equipment designed for pulsed operations, peak tube potential in kV, scan time in seconds, and either tube current in mA, x-ray pulse width in seconds, and the number of x-ray pulses per scan or the product of tube current, x-ray pulse width, and the number of x-ray pulses in mAs;

(D) for CT equipment not designed for pulsed operation, peak tube potential in kV, and either tube current in mA and scan time in seconds or the product of tube current and exposure time in mAs when the scan time and exposure time are equivalent; and

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§289.233(c)(116)(E)

(E) for all other equipment, peak tube potential in kV and either tube current in mA and exposure time in seconds or the product of tube current and exposure time in mAs.

(117) Termination--A release by the agency of the obligations and authorizations of the registrant under the terms of the certificate of registration. It does not relieve a person of duties and responsibilities imposed by law.

(118) Texas Regulations for Control of Radiation (TRCR)--All sections of Title 25 Texas Administrative Code (TAC), Chapter 289.

(119) Total effective dose equivalent (TEDE)--For external exposures only to x-ray radiation from radiation machines, the TEDE is equal to the DDE. If an individual receives an occupational dose from both radiation machines and radioactive materials, the TEDE is the sum of the DDE for external exposures and the committed effective dose equivalent for internal exposures as defined in §289.201(b) of this title.

(120) Tube--An x-ray tube, unless otherwise specified.

(121) Tube housing assembly--The tube housing with tube installed. It includes high-voltage and/or filament transformers and other appropriate elements when such are contained within the tube housing.

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§289.233(c)(122)

(122) Unrestricted area (uncontrolled area)--An area, access to which is neither limited nor controlled by the registrant. For purposes of this chapter, "uncontrolled area" is an equivalent term.

(123) Useful beam--Radiation that passes through the window, aperture, cone, or other collimating device of the source housing. Also referred to as the primary beam.

(124) Veterinarian--An individual licensed by the Texas Board of Veterinary Medical Examiners.

(125) Very high radiation area--An area, accessible to individuals, in which radiation levels from radiation machines external to the body could result in an individual receiving an absorbed dose in excess of 500 rads (5 grays) in one hour at 1 meter (m) from a radiation machine or from any surface that the radiation penetrates. At very high doses received at high dose rates, units of absorbed dose, gray and rad, are appropriate, rather than units of DE, Sv and rem.

(126) Violation--An infringement of any rule, license or registration condition, order of the agency, or any provision of the Act.

(127) Whole body--For purposes of external exposure, head, trunk including male gonads, arms above the elbow, or legs above the knee.

(128) Worker--An individual engaged in work under a certificate of registration issued by the agency and controlled by a registrant, but does not include the registrant.

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§289.233(c)(129)

(129) X-ray control--A device that controls input power to the x-ray high-voltage generator and/or the x-ray tube. It includes equipment such as timers, phototimers, automatic brightness stabilizers, and similar devices that control the technique factors of an x-ray exposure.

(130) X-ray equipment--An x-ray system, subsystem, or component thereof. For the purposes of this rule, types of x-ray equipment are as follows:

(A) portable x-ray equipment--x-ray equipment mounted on a permanent base with wheels and/or casters for moving while completely assembled. Portable x-ray equipment may also include equipment designed to be hand-carried; or

(B) stationary x-ray equipment--x-ray equipment that is installed in a fixed location.

(131) X-ray field--That area of the intersection of the useful beam and any one of the set of planes parallel to and including the plane of the image receptor, whose perimeter is the locus of points at which the exposure rate is one-fourth of the maximum in the intersection.

(132) X-ray high-voltage generator--A device that transforms electrical energy from the potential supplied by the x-ray control to the tube operating potential. The device may also include means for transforming alternating current to direct current, filament transformers for the x-ray tubes, high-voltage switches, electrical protective devices, and other appropriate elements.

§289.233(c)(133)

(133) X-ray system--An assemblage of components for the controlled production of x rays. It includes minimally an x-ray high-voltage generator, an x-ray control, a tube housing assembly, a beam-limiting device, and the necessary supporting structures. Additional components that function with the system are considered integral parts of the system.

(134) X-ray subsystem--Any combination of two or more components of an x-ray system.

(135) X-ray tube--Any electron tube that is designed to be used primarily for the production of x rays.

(136) Year--The period of time beginning in January used to determine compliance with the provisions of this chapter. The registrant may change the starting date of the year used to determine compliance by the registrant provided that the change is made at the beginning of the year and that no day is omitted or duplicated in consecutive years.

(d) Exemptions.

(1) Electronic equipment that produces radiation incidental to its operation for other purposes is exempt from the registration and notification requirements of this section, provided that the dose equivalent rate averaged over an area of 10 square centimeters (cm²) does not exceed 0.5 millirem per hour (mrem/hr) at 5 centimeters (cm) from any accessible surface of such equipment. The production, testing, or factory servicing of such equipment shall not be exempt.

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**These rules do not apply to certain
electronic equipment such as televisions.**

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§289.233(d)(2)

(2) Radiation machines in transit or in storage incident to transit are exempt from the requirements of this section. This exemption does not apply to the providers of radiation machines for mobile services. Facilities that have placed all radiation machines in storage, including on-site storage, and have notified the agency in writing, are exempt from the requirements of this section. This exemption is void if any radiation machine is energized resulting in the production of radiation.

(3) Domestic television receivers and video display terminals, including the servicing of such devices, are exempt from the requirements of this section.

(4) Inoperable radiation machines are exempt from the requirements of this section. For the purposes of this section, an inoperable radiation machine means a radiation machine that cannot be energized when connected to a power supply without repair or modification.

(5) Financial institutions that take possession of radiation machines as the result of foreclosure, bankruptcy, or other default of payment are exempt from the requirements in this section to the extent that they demonstrate that the unit is operable for the sole purpose of selling, leasing, or transferring.

(6) Individuals who are sole veterinarians, sole operators, and the only occupationally exposed individual are exempt from the following requirements:

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If you have notified the agency in writing that all of your x-ray machines are in storage, these rules do not apply to you. But, if you energize an x-ray machine in storage, the rules apply.

These rules do not apply to x-ray machines that will not work when plugged in without being repaired.

These rules do not apply to financial institutions that have x-ray machines because of a client's bankruptcy or foreclosure. They may use the machine only to show that the machines work in order to sell, lease, or transfer them.

A veterinarian who practices alone, who is the only person operating the x-ray machines, and the only worker exposed to radiation, does not have to have operating and safety procedures, give instructions to workers, or post notices required by this rule.

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§289.233(d)(6)(A)

(A) subsection (i)(4)(B) of this section "Posting of notices to workers;"

(B) subsection (i)(3)(G) of this section "Instructions to workers;" and

(C) operating and safety procedures in accordance with subsection (i)(2) of this section.

(7) The agency may, upon application therefore or upon its own initiative, exempt a source of radiation or a kind of use or user from the requirements of this chapter if the agency determines that the exemption is not prohibited by law and will not result in a significant risk to public health and safety and the environment. In determining such exemptions, the agency will consider:

(A) state of technology;

(B) economic considerations in relation to benefits to the public health and safety; and

(C) other societal, socioeconomic, or public health and safety considerations.

(e) Communications.

Under certain conditions, the agency may exempt an x-ray machine or use of an x-ray machine from these rules.

§289.233(e)(1)

(1) Except where otherwise specified, all communications and reports concerning this chapter and applications filed under them should be addressed to the **Radiation Control, Department of State Health Services, P.O. Box 149347**, Austin, Texas, **78714-9347**. Communications, reports, and applications may be delivered in person to the agency's office located at 8407 Wall Street, Austin, Texas.

(2) Documents transmitted to the agency will be deemed submitted on the date of the postmark, telegram, telefacsimile, or electronic media transmission.

(f) Interpretations. Except as specifically authorized by the agency in writing, no interpretation of the meaning of this chapter by any officer or employee of the agency other than a written legal interpretation by the agency, will be considered binding upon the agency.

(g) Fees for certificates of registration for veterinary facilities.

(1) Payment of fees.

(A) Each application for a certificate of registration shall be accompanied by a nonrefundable fee of \$264. **No application will be accepted for filing or processed prior to payment of the full amount specified.**

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**Mail Correspondence to:
Radiation Control
Department of State Health Services
P.O. Box 149347
Austin, TX 78714-9347**

**Deliver correspondence to our office at:
8407 Wall Street, Austin TX**

**We consider correspondence received on
the date of the postmark, telegram, fax, or
electronic mail.**

**Any correspondence you send to the
agency may be an "open record" and can be
viewed by the public. You may request that
your correspondence be kept confidential,
but you have to justify why. The specific,
instructions you must follow in order to
keep your documents confidential are on
pages 233-94 through 97. Official
interpretations of these rules must be made
be the agency.**

**Send in a fee when you send in your
application for a certificate of registration.
After you are registered you will be billed
every two years.**

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§289.233(g)(1)(B)

(B) A nonrefundable fee of \$264 shall be paid for each certificate of registration for radiation machines used in veterinary medicine. The fee shall be paid every two years and shall be paid in full on or before the due date stated on the invoice. In the case of a single certificate of registration that authorizes more than one category of use, the category listed in §289.204(j) of this title (relating to Fees for Certificates of Registration, Radioactive Material Licenses, Emergency Planning and Implementation, and Other Regulatory Services) and assigned the higher fee will be used. For each additional use location on a single certificate of registration, the registrant shall pay an additional \$72.

(C) Each application for reciprocal recognition of an out-of-state registration in accordance with subsection (h)(8) of this section shall be accompanied by the \$264 fee, provided that no such fee has been submitted within 24 months of the date of commencement of the proposed activity.

(D) Fee payments shall be in cash or by check or money order made payable to the Department of State Health Services. The payments may be made by personal delivery to the central office, Radiation Control, Department of State Health Services, 1100 West 49th Street, Austin, Texas, or mailed to Radiation Control, Department of State Health Services, P.O. Box 149347, MC 2003, Austin, Texas, 78714-9347.

(2) Failure to pay prescribed fees.

This fee is nonrefundable.

Out of state veterinarians who practice in Texas and use an x-ray machine pay \$264.00.

You may pay your fee with cash, check, or money order. Payments can be mailed or you may pay in person.

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§289.233(g)(2)(A)

(A) In any case where the agency finds that an applicant for a certificate of registration has failed to pay the fee prescribed in this section, the agency will not process that application until such fee is paid.

(B) In any case where the agency finds that a registrant has failed to pay a fee prescribed by this section by the due date, the agency may implement compliance procedures as provided in subsection (k)(2) of this section.

(3) Fees for Texas Online participation. For all applications and renewal applications, the department is authorized to collect subscription and convenience fees, in amounts determined by the Texas Online Authority, to recover costs associated with application and renewal application processing through Texas Online.

(h) Registration of radiation machine use.

(1) Requirements for application for registration for use of radiation machines for veterinary medicine.

(A) Each person having a radiation machine used in veterinary medicine shall apply for registration with the agency within 30 days after beginning use of the radiation machine, except for mobile services that shall be registered in accordance with subsection (h)(2) of this section.

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If you do not send in the fee with your application, the application will not be processed.

If you do not pay your fee, you will be in violation of the rules.

The agency will be collecting subscription and convenience fees for all applications and renewal applications. The cost is to be determined by the Texas Online Authority.

Send in an application for registration within 30 days from the day you first use your x-ray machine with exception of mobile services that have to be registered before beginning use.

Fill out the agency application. The instructions on the application explain how to fill it out. Also send in BRC Form 226-1 with your application. The forms can be downloaded from the agency website.

www.dshs.state.tx.us/radiation/forms.htm

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§289.233(h)(1)(B)

(B) Application for registration shall be completed on forms prescribed by the agency and shall contain all the information required by the form and accompanying instructions.

(C) The applicant shall be qualified by reason of training and experience to use the radiation machine for the purpose requested in accordance with this section in such a manner as to minimize danger to occupational and public health and safety.

(D) The applicant's proposed equipment, facilities, and operating and safety procedures shall be adequate to minimize danger to occupational and public health and safety.

(E) A radiation safety officer (RSO) shall be designated on each application form. The qualifications of that individual shall be submitted to the agency with the application.

(i) The RSO shall have the following qualifications:

(I) knowledge of potential hazards and emergency precautions; and

(II) completed educational courses related to ionizing radiation safety or a radiation safety officer course; or

(III) experience in the use and familiarity of the type of equipment used; and

You must have training and experience to safely use x-ray machines.

You must have adequate machines, facilities, and procedures to protect occupational and public health and safety.

You must name a radiation safety officer (RSO) for your office.

You must have these qualifications to be an RSO.

- **knowledge of possible hazards**
- **radiation safety training**
- **experience using the x-ray machine**

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§289.233(h)(1)(E)(ii)

(ii) In addition to the qualifications in clause (i) of this subparagraph, documentation of the following shall be submitted to the agency:

(I) for veterinarian RSOs, veterinary license board number; or

(II) for non-veterinarian RSOs, two years minimum experience in the use of radiation machines in veterinary medicine under the supervision of a licensed veterinarian.

(iii) The RSO identified on a certificate of registration for use of radiation machines for veterinary medicine issued before September 1, 1993, need not comply with the training requirements in this subsection.

(iv) Specific duties of the RSO include, but are not limited to, the following:

(I) establishing and overseeing operating and safety procedures that maintain radiation exposures as low as reasonably achievable (ALARA), and to review them regularly to ensure that the procedures are current and conform with this chapter;

(II) ensuring that individual monitoring devices are properly used by occupationally-exposed personnel, that records are kept of the monitoring results, and that timely notifications are made as required by subsections (i)(4)(B) and (C) and (j)(3)(B)-(D) of this section;

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You must submit to the agency the following documentation:

RSOs who are veterinarians must send in their licensing board number.

RSOs who are not veterinarians must send in documentation showing two years of working with veterinarian x-ray machines.

Radiation Safety Officers are responsible for:

- **preparing operating and safety procedures and keeping them updated**
- **making sure that occupationally exposed workers are properly using individual monitoring devices, records are kept of the monitoring results: and notification are made to workers regarding monitoring results, posting requirements; and reports**
- **telling us about lost or stolen x-ray machines or overexposures**

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§289.233(h)(1)(E)(iv)(III)

(III) investigating and reporting to the agency each known or suspected case of radiation exposure to an individual or radiation level detected in excess of limits established by this chapter and each theft or loss of source(s) of radiation, determining the cause, and taking steps to prevent its recurrence;

(IV) having a thorough knowledge of management policies and administrative procedures of the registrant and keeping management informed on a periodic basis of the performance of the registrant's radiation protection program, if applicable;

(V) assuming control and having the authority to institute corrective actions including shut-down of operations when necessary in emergency situations or unsafe conditions;

(VI) making and maintaining records as required by this chapter; and

(VII) ensuring that personnel are adequately trained and complying with this chapter, the conditions of the certificate of registration, and the operating and safety procedures of the registrant.

(F) An application for use of radiation machines for veterinary medicine shall be signed by a licensed veterinarian. The signature of the administrator, president, or chief executive officer will be accepted in lieu of a veterinarian's signature if the facility has more than one veterinarian who may direct the operation of radiation machines. The application shall also be signed by the RSO if the RSO is someone other than the licensed veterinarian.

- **knowing policies & procedures**
- **stopping unsafe practices**
- **keeping records**
- **training employees**
- **making sure the rules are followed**

A licensed veterinarian must sign the application for use of x-ray machines.

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§289.233(h)(1)(G)

(G) Each application for a certificate of registration shall be accompanied by the fee prescribed in subsection (g) of this section. No application will be accepted for filing or processed prior to payment of the full amount specified.

(H) Each application shall be accompanied by a completed BRC Form 226-1 (Business Information Form).

(I) The agency may at any time after the filing of the original application, require further statements in order to enable the agency to determine whether the certificate of registration should be issued or denied.

(J) An application for a certificate of registration may include a request for a certificate of registration authorizing one or more activities.

(K) Applications and documents submitted to the agency may be made available for public inspection except that the agency may withhold any document or part thereof from public inspection in accordance with subsection (j)(1)(K)-(N) of this section.

(2) Application for registration of mobile service operation used in veterinary medicine. In addition to the requirements of paragraph (1) of this subsection, each applicant shall apply for and receive authorization for mobile service operation before beginning mobile service operation. The following shall be submitted:

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The \$264.00 fee must be submitted with the application or the application will not be processed.

You must submit BRC Form 226-1 with the application also.

The agency may ask for more information after you have sent in your application.

You must get approval for mobile x-ray services before you begin providing them. Send in the following information with your request for approval:

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§289.233(h)(2)(A)

(A) an established main location where the machine(s), records, etc. will be maintained for inspection. This shall be a street address, not a post office box number;

(B) a sketch or description of the normal configuration of each radiation machine's use, including the operator's position and any ancillary personnel's location during exposures. If a mobile van is used with a fixed unit inside, furnish the floor plan indicating protective shielding and the operator's location; and

(C) a current copy of the applicant's operating and safety procedures regarding radiological practices for protection of operators, employees, and the general public.

(3) Issuance of certificate of registration.

(A) Upon a determination that an application meets the requirements of the Act and the requirements of the agency, the agency may issue a certificate of registration authorizing the proposed activity in such form and containing such conditions and limitations as the agency deems appropriate or necessary.

(B) The agency may incorporate in the certificate of registration at the time of issuance, or thereafter by amendment, such additional requirements and conditions with respect to the registrant's possession, use, and transfer of radiation machines subject to this chapter as it deems appropriate or necessary in order to:

(i) minimize danger to occupational and public health and safety;

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- **A main office where your x-ray machines and records can be inspected by the agency.**
- **An explanation of how the x-ray machine, the operator, and any other personnel are typically positioned during an x-ray.**
- **Your operating and safety procedures for mobile x-ray operations.**

Your certificate of registration will be issued if your application is complete, meets all the requirements, and the fee is paid.

The agency may add conditions to your certificates of registration if necessary to protect occupational and public health and safety.

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§289.233(h)(3)(B)(ii)

(ii) require additional reports and the keeping of additional records as may be appropriate or necessary; and

(iii) prevent loss or theft of radiation machines subject to this section.

(4) Specific terms and conditions of certificates of registration.

(A) Each certificate of registration issued in accordance with this section shall be subject to the applicable provisions of the Act, now or hereafter in effect, and to the applicable requirements of this chapter and orders of the agency.

(B) No certificate of registration issued or granted under this section shall be transferred, assigned, or in any manner disposed of, either voluntarily or involuntarily, to any person unless the agency authorizes the transfer in writing.

(C) Each person registered by the agency for radiation machine use in accordance with this section shall confine use and possession of the radiation machine registered to the locations and purposes authorized in the certificate of registration.

You cannot give your certificate of registration to another person.

You must use only the x-ray machine(s) for the uses and at the locations listed on your certificate of registration.

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§289.233(h)(4)(D)

(D) In making a determination whether to grant, deny, amend, renew, revoke, suspend, or restrict a certificate of registration, the agency may consider the technical competence and compliance history of an applicant or holder of a certificate of registration. After an opportunity for a hearing, the agency shall deny an application for a certificate of registration, an amendment to a certificate of registration, or renewal of a certificate of registration if the applicant's compliance history reveals that at least three agency actions have been issued against the applicant, within the previous six years, that assess administrative or civil penalties against the applicant, or that revoke or suspend the certificate of registration.

(5) Responsibilities of the registrant.

(A) Each registrant shall inventory all radiation machines at an interval not to exceed one year. The inventory shall be made and maintained for inspection by the agency in accordance with subsection (j)(2) of this section and shall include:

(i) manufacturer's name;

(ii) model and serial number of the control panel; and

(iii) location of radiation machine(s), for example, room number.

Your compliance history will be reviewed.

You must inventory all of your x-ray machines each year. Keep a record of the inventory and include the manufacturer's name, the model and serial number of the control panel, and location of the radiation machine(s).

§289.233(h)(5)(B)

(B) Notification to the agency concerning radiation machine inventory is required within 30 days of either of the following:

(i) any change in the category(ies) of machine type or type of use as authorized in the certificate of registration (for example, addition of a computerized tomography machine to the authorized veterinary radiographic machine); or

(ii) any increase in the number of machines authorized by the certificate of registration in any machine type or type of use category.

(C) The registrant shall notify the agency in writing of any changes that would render the information contained in the application for registration and/or the certificate of registration inaccurate. Notification is required within 30 days of the following changes:

(i) name and mailing address;

(ii) street address where machine will be used;

(iii) RSO; or

(iv) name of entity contracted for "provider of equipment," registered in accordance with §289.226 of this title (relating to Registration of Radiation Machines Use and Services.)

Notify the agency within 30 days if your inventory changes because you added a machine(s) or you changed the category(ies) of machine type or type of use as authorized in the certificate of registration.

If any of the information in your application changes, such as your name, address, RSO, etc., tell the agency in writing within 30 days of the change.

§289.233(h)(5)(D)

(D) The following criteria apply to radiation machines used for loaner or demonstration radiation machines. For persons having a valid certificate of registration, radiation machines used for loaner or demonstration radiation machines may be used for up to 60 days. After 60 days, the registrant shall notify the agency of the following:

(i) any change in the category(ies) of machine type or type of use as authorized in the certificate of registration (for example, addition of a computerized tomography machine to the authorized veterinary radiographic machine); or

(ii) any increase in the number of machines authorized by the certificate of registration in any machine type or type of use category.

(E) No registrant shall engage any person for services described in §289.226(b)(9) and (10) of this title until such person provides to the registrant evidence of registration with the agency.

(F) The following applies to voluntary or involuntary petitions for bankruptcy.

(i) Each registrant shall notify the agency, in writing, immediately following the filing of a voluntary or involuntary petition for bankruptcy by the registrant or its parent company. This notification shall include:

If you have a valid certificate of registration and you are using radiation machines for loaner or demonstration radiation machines, these machines may be used for up to 60 days without notifying the agency.

If you decide to contract with a service company, make sure that the company is registered with the agency.

Let the agency know in writing if you claim bankruptcy.

§289.233(h)(5)(F)(i)(I)

(I) the bankruptcy court in which the petition for bankruptcy was filed; and

(II) the date of the filing of the petition.

(ii) A copy of the "petition for bankruptcy" shall be submitted to the agency along with the written notification.

(G) The registrant is responsible for complying with this chapter and the conditions of the certificate of registration.

(H) No person shall use radiation machines that are not authorized in the certificate of registration issued by the agency.

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Also tell the agency, in writing, the bankruptcy court in which you filed and the date you filed.

Include a copy of your petition for bankruptcy with your written notice.

Do not use radiation machines unless they have been registered with the agency.

Certificates for radiation machines used in veterinary medicine do not expire.

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(6) Termination of certificates of registration. When a registrant decides to terminate all activities involving radiation machines authorized under the certificate of registration, the registrant shall notify the agency immediately and do the following:

(A) request termination of the certificate of registration in writing;

(B) submit to the agency a record of the disposition of the radiation machines and if transferred, to whom transferred; and

(C) pay any outstanding fees in accordance with subsection (g) of this section.

(7) Modification, suspension, and revocation of certificates of registration.

(A) The terms and conditions of all certificates of registration shall be subject to revision or modification. A certificate of registration may be suspended or revoked by reason of amendments to the Act, by reason of requirements of this chapter or orders issued by the agency.

(B) Any certificate of registration may be revoked, suspended, or modified, in whole or in part, for any of the following:

When you decide to quit using x-ray machines, you must do the following things:

- **request termination of your certificate of registration, in writing**
- **tell us in writing what you will do with your x-ray machine and if the machine is transferred, who the machine is transferred to**
- **pay any outstanding fees**

Your certificate may be modified, suspended, or revoked.

§289.233(h)(7)(B)(i)

(i) any material false statement in the application or any statement of fact required under provisions of the Act;

(ii) conditions revealed by such application or statement of fact or any report, record, or inspection, or other means that would warrant the agency to refuse to grant a certificate of registration on an original application;

(iii) violation of, or failure to observe any of the terms and conditions of the Act, this chapter, the certificate of registration, or order of the agency; or

(iv) existing conditions that constitute a substantial threat to the public health or safety or the environment.

(C) Each certificate of registration revoked by the agency ends at the end of the day on the date of the agency's final determination to revoke the certificate of registration, or on the revocation date stated in the determination, or as otherwise provided by the agency order.

(D) Except in cases in which the occupational and public health or safety requires otherwise, no certificate of registration shall be suspended or revoked unless, prior to the institution of proceedings therefore, facts or conduct that may warrant such action shall have been called to the attention of the registrant in writing and the registrant shall have been afforded an opportunity to demonstrate compliance with all lawful requirements.

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§289.233(h)(8)

(8) Reciprocal recognition for out-of-state certificates of registration.

(A) Whenever any radiation machine is to be brought into the state for any temporary use, the person proposing to bring the machine into the state shall apply for and receive a notice from the agency granting reciprocal recognition prior to beginning operations. The request for reciprocity shall include the following:

(i) completed BRC Form 226-1 (Business Information Form);

(ii) completed BRC Form 252-3 (Notice of Intent to Work in Texas Under Reciprocity);

(iii) copy of the applicant's current state certificate of registration or equivalent document;

(iv) copy of the applicant's current operating and safety procedures pertinent to the proposed use; and

(v) fee as specified in subsection (g) of this section.

(B) Upon a determination that the request for reciprocity meets the requirements of the agency, the agency may issue a notice granting reciprocal recognition authorizing the proposed use.

This applies only to veterinary machines brought into Texas from out-of-state for temporary use.

§289.233(h)(8)(C)

(C) Once reciprocity is granted, the out-of-state registrant shall file a BRC Form 252-3 with the agency prior to each entry into the state. This form shall be filed at least three working days before the radiation machine is to be used in the state. If, for a specific case, the three-day period would impose an undue hardship, the out-of-state registrant may, at the determination of the agency, obtain permission to proceed sooner.

(D) When radiation machines are used as authorized under reciprocity, the out-of-state registrant shall have the following in its possession at all times for inspection by the agency:

(i) completed BRC Form 252-3;

(ii) copy of the notice from the agency granting reciprocity;

(iii) copy of the out-of-state registrant's operating and safety procedures; and

(iv) copy of the applicable rules as specified in the notice granting reciprocity.

(E) If the state from which the radiation machine is proposed to be brought does not issue certificates of registration or equivalent documents, a certificate of registration shall be obtained from the agency in accordance with the requirements of this section.

§289.233(h)(8)(F)

(F) The agency may withdraw, limit, or qualify its acceptance of any certificate of registration or equivalent document issued by another agency upon determining that such action is necessary in order to prevent undue hazard to occupational and public health and safety or property.

(G) Reciprocal recognition will expire one year from the date it is granted. A new request for reciprocity shall be submitted to the agency each year. Reciprocity requests made after the initial request shall include only the following:

(i) a completed BRC Form 226-1;

(ii) a completed BRC Form 252-3;

(iii) the fee as specified in subsection (g) of this section; and

(iv) copy of the applicant's current state certificate of registration or equivalent document; and

(v) copy of the applicant's current operating and safety procedures pertinent to the proposed use.

(i) Use of radiation machines for veterinary medicine.

(1) As low as reasonably achievable. The registrant shall use, to the extent practical, procedures and engineering controls based upon sound radiation protection principles to achieve occupational doses and public doses that are as low as reasonably achievable.

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§289.233(i)(2)

(2) Operating and safety procedures. 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.

(A) The registrant shall document that each individual operating a radiation machine has read the operating and safety procedures and shall maintain this documentation for inspection by the agency in accordance with subsection (j)(2) of this section. The documentation shall include the following:

(i) name and signature of individual;

(ii) date individual read the operating and safety procedures; and

(iii) initials of the RSO.

(B) The operating and safety procedures shall include, but are not limited to, the following procedures as applicable:

(i) posting notices to workers in accordance with paragraph (4)(B) of this subsection;

(ii) instructions to workers in accordance with paragraph (3)(G) of this subsection;

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Operating and safety procedures must be in writing and must include certain items.

The agency has sample operating and safety procedures you may use to develop your own procedures. You can download these sample procedures at:

www.dshs.state.tx.us/radiation/regguide.shtm

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§289.233(i)(2)(B)(iii)

(iii) notifications and reports to individuals in accordance with paragraph (4)(B) and (C) of this subsection and subsection (j)(3)(B)-(D) of this section;

(iv) ordering x-ray exams in accordance with subsection (b)(1) of this section;

(v) occupational dose requirements in accordance with paragraph (3)(A) of this subsection;

(vi) compliance with dose and personnel monitoring requirements in accordance with paragraphs (3)(B), (D), and (E) of this subsection;

(vii) controlling a radiation area in accordance with paragraph (4)(D) of this subsection;

(viii) use of a technique chart in accordance with paragraph (5)(A) of this subsection;

(ix) use of protective devices in accordance with paragraph (3)(H) of this subsection;

(x) exposure of individuals other than the animal in accordance with paragraph (3)(I) of this subsection;

(xi) holding of animals or image receptors in accordance with paragraph (3)(J) of this subsection;

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§289.233(i)(2)(B)(xii)

(xii) control of scattered radiation in accordance with paragraph (6)(C) of this subsection; and

(xiii) film processing program or digital image processing in accordance with paragraphs (9)-(11) of this subsection.

(3) Personnel requirements.

(A) Occupational dose limits. 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 subparagraph regarding dose limits to individuals, and the personnel monitoring requirements of subparagraph (B) of this paragraph.

(i) The registrant shall control the occupational dose to individuals to the following dose limits.

(I) An annual limit shall be the TEDE being equal to 5 rems (0.05 Sv).

(II) The annual limits to the lens of the eye, to the skin of the whole body, and to the skin of the extremities shall be:

(-a-) an LDE of 15 rems (0.15 Sv); and

(-b-) an SDE of 50 rems (0.5 Sv) to the skin of the whole body or to the skin of any extremity.

There are radiation dose limits for workers, pregnant women m and the public.

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§289.233(i)(3)(A)(i)(III)

(III) The annual limits for a minor shall be 10% of the annual occupational dose limits specified in subclauses (I) and (II) of this clause.

(IV) If a woman declares her pregnancy, the registrant shall ensure that the DE to an embryo/fetus during the entire pregnancy, due to occupational exposure of a declared pregnant woman, does not exceed 0.5 rem (5 mSv). If a woman chooses not to declare pregnancy, the occupational dose limits specified in subclauses (I) and (II) of this clause are applicable to the woman.

(-a-) The registrant shall make efforts to avoid substantial variation above a uniform monthly exposure rate to a declared pregnant woman so as to satisfy the limit in clause (i) of this subparagraph. The National Council on Radiation Protection and Measurements recommended in NCRP Report No. 91 "Recommendations on Limits for Exposure to Ionizing Radiation" (June 1, 1987) that no more than 0.05 rem (0.5 mSv) to the embryo/fetus be received in any one month.

(-b-) If by the time the woman declares pregnancy to the registrant, the DE to the embryo/fetus has exceeded 0.45 rem (4.5 mSv), the registrant shall be deemed to be in compliance with clause (i) of this subparagraph, if the additional DE to the embryo/fetus does not exceed 0.05 rem (0.5 mSv) during the remainder of the pregnancy.

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§289.233(i)(3)(A)(i)(IV)(-c-)

(-c-) The DE to an embryo/fetus shall be taken as the DE that is most representative of the DE to the embryo/fetus from external radiation, that is, in the mother's lower torso region.

(-d-) If multiple measurements have been made, assignment of the DDE for the declared pregnant woman from the individual monitoring device that is most representative of the DE to the embryo/fetus shall be the DE to the embryo/fetus. Assignment of the highest DDE for the declared pregnant woman to the embryo/fetus is not required unless that dose is also the most representative DDE for the region of the embryo/fetus.

(-e-) If multiple measurements have not been made, assignment of the highest DDE for the declared pregnant woman shall be the DE to the embryo/fetus.

(ii) The assigned DDE shall be for the portion of the body receiving the highest exposure. The assigned SDE shall be the dose averaged over the contiguous 10 cm² of skin receiving the highest exposure.

(iii) When a protective apron is worn while working with fluoroscopic equipment used for clinical diagnostic or research purposes, the effective dose equivalent (EDE) for external radiation shall be determined as follows:

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§289.233(i)(3)(A)(iii)(I)

(I) when only one individual monitoring device is used and it is located at the neck (collar) outside the protective apron, the reported DDE shall be the EDE for external radiation; or

(II) when only one individual monitoring device is used and it is located at the neck (collar) outside the protective apron, and the reported dose exceeds 25% of the limit specified in clause (i) of this subparagraph, the reported DDE value multiplied by 0.3 shall be the EDE for external radiation; or

(III) when individual monitoring devices are worn, both under the protective apron at the waist and outside the protective apron at the neck (collar), the EDE for external radiation shall be assigned the value of the sum of the DDE reported for the individual monitoring device located at the waist under the protective apron multiplied by 1.5 and the DDE reported for the individual monitoring device located at the neck (collar) outside the protective apron multiplied by 0.04.

(iv) The DDE, LDE, and SDE may be assessed from surveys or radiation measurements for the purpose of demonstrating compliance with the occupational dose limits, if the individual monitoring device was not in the region of highest potential exposure, or the results of individual monitoring are unavailable.

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§289.233(i)(3)(A)(v)

(v) The registrant shall reduce the dose that an individual may be allowed to receive in the current year by the amount of occupational dose received from radiation machines or radioactive materials while employed by any other person. See subparagraph (F)(iv) of this paragraph.

(B) Conditions requiring individual monitoring of occupational dose. Each registrant shall monitor exposures from radiation machines at levels sufficient to demonstrate compliance with the occupational dose limits of this section. As a minimum, each registrant shall monitor occupational exposure to radiation from radiation machines and shall supply and require the use of individual monitoring devices by:

(i) adults likely to receive, in one year from sources external to the body, a dose in excess of 10% of the limits in subparagraph (A)(i) of this paragraph;

(ii) minors likely to receive, in one year from radiation machines external to the body, a DDE in excess of 0.1 rem (1 mSv), an LDE in excess of 0.15 rem (1.5 mSv), or an SDE to the skin of the whole body or to the skin of any extremities in excess of 0.5 rem (5 mSv);

(iii) declared pregnant women likely to receive during the entire pregnancy, from radiation machines external to the body, a DDE in excess of 0.1 rem (1 mSv); and

(iv) individuals entering a high or very high radiation area.

Your radiation workers must wear a radiation dosimeter if the workers' yearly dose will be more than 10% of the limit.

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§289.233(i)(3)(C)

(C) Dose limits for individual members of the public.

(i) Each registrant shall conduct operations so that:

(I) the TEDE to individual members of the public from exposure to radiation from radiation machines does not exceed 0.5 rem (5 mSv) in a year, exclusive of the dose contribution from background radiation, exposure of patients to radiation for the purpose of medical diagnosis or therapy, or to voluntary participation in medical research programs; and

(II) the dose in any unrestricted area from registered external sources does not exceed 0.002 rem (0.02 mSv) in any one hour.

(ii) If the registrant permits members of the public to have access to restricted areas, the limits for members of the public continue to apply to those individuals.

(iii) The agency may impose additional restrictions on radiation levels in unrestricted areas in order to restrict the collective dose.

(D) Compliance with dose limits for individual members of the public.

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§289.233(i)(3)(D)(i)

(i) The registrant shall make or cause to be made surveys of radiation levels in unrestricted areas to demonstrate compliance with the dose limits for individual members of the public as required in subparagraph (C) of this paragraph.

(ii) A registrant shall show compliance with the annual dose limit in subparagraph (C) of this paragraph by demonstrating by measurement or calculation that the TEDE to the individual likely to receive the highest dose from the registered operation does not exceed the annual dose limit.

(iii) Registrants exempt from individual monitoring requirements in accordance with subparagraph (B)(ii) of this paragraph are exempt from the requirements of clauses (i) and (ii) of this subparagraph.

(E) Location and use of individual monitoring devices.

(i) Each registrant shall ensure that individuals who are required to monitor occupational doses in accordance with subparagraph (B) of this paragraph wear and use individual monitoring devices as follows.

(I) An individual monitoring device shall be assigned to and worn by only one individual.

If your radiation workers must wear a radiation dosimeter, there are rules about where it must be worn and how the dosimeter must be handled.

§289.233(i)(3)(E)(i)(II)

(II) An individual monitoring device used for monitoring the dose to the whole body shall be worn at the unshielded location of the whole body likely to receive the highest exposure. When a protective apron is worn, the location of the individual monitoring device is typically at the neck (collar).

(III) If an additional individual monitoring device is used for monitoring the dose to an embryo/fetus of a declared pregnant woman, in accordance with subparagraph (B)(iii) of this paragraph, it shall be located at the waist under any protective apron being worn by the woman.

(IV) An individual monitoring device used for monitoring the LDE, to demonstrate compliance with subparagraph (A)(i)(II)(-a-) of this paragraph, shall be located at the neck (collar) or at a location closer to the eye, outside any protective apron being worn by the monitored individual.

(V) An individual monitoring device used for monitoring the dose to the extremities, to demonstrate compliance with subparagraph (A)(i)(II)(-b-) of this paragraph, shall be worn on the extremity likely to receive the highest exposure. Each individual monitoring device, to the extent practicable, shall be oriented to measure the highest dose to the extremity being monitored.

(ii) Each registrant shall ensure that individual monitoring devices are returned to the dosimetry processor for proper processing.

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§289.233(i)(3)(E)(iii)

(iii) Each registrant shall ensure that adequate precautions are taken to prevent a deceptive exposure of an individual monitoring device.

(F) Determination of occupational dose for the current year.

(i) For each individual who is likely to receive, in a year, an occupational dose requiring monitoring in accordance with subparagraph (B) of this paragraph, the registrant shall determine the occupational radiation dose received during the current year. Occupational dose includes doses received from exposure to registered/licensed or unregistered/unlicensed sources of radiation as defined in subsection (c) of this section.

(ii) In complying with the requirements of clause (i) of this subparagraph, a registrant may:

(I) accept, as a record of the occupational dose that the individual received during the current year, BRC Form 233-1 (Occupational Exposure Record for a Monitoring Period) from prior or other current employers, or other clear and legible record, of all information required on that form and indicating any periods of time for which data are not available; or

If your radiation workers must wear a radiation dosimeter, you must keep a record of all of the occupational dose of those workers for each year.

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§289.233(i)(3)(F)(ii)(II)

(II) accept, as a record of the occupational dose that the individual received during the current year, a written signed statement from the individual, or from the individual's prior or other current employer(s) for work involving radiation exposure, that discloses the nature and the amount of any occupational dose that the individual received during the current year; or

(III) obtain reports of the individual's DE from prior or other current employer(s) for work involving radiation exposure, or the individual's current employer, if the individual is not employed by the registrant, by telephone, telegram, facsimile, or letter. The registrant shall request a written verification of the dose data if the authenticity of the transmitted report cannot be established.

(iii) The registrant shall record the exposure data for the current year, as required by clause (i) of this subparagraph, on BRC Form 233-1, or other clear and legible record, of all the information required on BRC Form 233-1.

(iv) If the registrant is unable to obtain a complete record of an individual's current occupational dose while employed by any other registrant or licensee, the registrant shall assume in establishing administrative controls in accordance with subsection (m)(5) of this section for the current year, that the allowable dose limit for the individual is reduced by 1.25 rems (12.5 millisieverts (mSv)) for each quarter; or 416 millirems (mrem) (4.16 mSv) for each month for which records were unavailable and the individual was engaged in activities that could have resulted in occupational radiation exposure.

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§289.233(i)(3)(F)(v)

(v) If an individual has incomplete (for example, a lost or damaged personnel monitoring device) current occupational dose data for the current year and that individual is employed solely by the registrant during the current year, the registrant shall:

(I) assume that the allowable dose limit for the individual is reduced by 1.25 rems (12.5 mSv) for each quarter;

(II) assume that the allowable dose limit for the individual is reduced by 416 mrem (4.16 mSv) for each month; or

(III) assess an occupational dose for the individual during the period of missing data using surveys, radiation measurements, or other comparable data for the purpose of demonstrating compliance with the occupational dose limits.

(vi) Administrative controls established in accordance with clause (iv) of this subparagraph shall be documented and maintained for inspection by the agency. Occupational dose assessments made in accordance with clause (v) of this subparagraph and records of data used to make the assessment shall be made and maintained for inspection by the agency. The registrant shall retain the records in accordance with subsection (j)(2) of this section.

§289.233(i)(3)(F)(vii)

(vii) Occupational exposure form. The following BRC Form 233-1 (Occupational Exposure Record for a Monitoring Period), is to be used to document occupational exposures for a monitoring period. (Please find BRC Form 233-1, "Occupational Exposure Record for a Monitoring Period" at the end of the section.)

(G) Instructions to workers.

(i) All individuals likely to receive in a year an occupational dose in excess of 100 millirem (1 millisievert) shall be:

(I) kept informed of the storage, transfer, or use of sources of radiation in the licensee's or registrant's workplace;

(II) instructed in the health protection problems associated with exposure to sources of radiation, in precautions or procedures to minimize exposure, and in the purposes and functions of protective devices employed;

(III) instructed in, and instructed to observe, to the extent within the worker's control, the applicable provisions of agency requirements and certificates of registration, for the protection of personnel from exposures to sources of radiation occurring in such areas;

If your radiation workers must wear a radiation dosimeter, the workers doses must be kept on BRC Form 233-1.

Train your employees in how to keep radiation exposures at a minimum and report unsafe radiation conditions.

§289.233(i)(3)(G)(i)(IV)

(IV) instructed of their responsibility to report promptly to the registrant any condition that may constitute, lead to, or cause a violation of agency requirements or certificate of registration conditions, or unnecessary exposure to sources of radiation;

(V) instructed in the appropriate response to warnings made in the event of any unusual occurrence or malfunction that may involve exposure to sources of radiation; and

(VI) advised as to the radiation exposure reports that workers may request in accordance with subsection (j)(3)(D)(i) and (ii) of this section.

(ii) The extent of these instructions shall be commensurate with potential radiological health protection problems associated with the source(s) of radiation in the workplace.

(H) Protective devices. Protective devices shall be utilized when required, as in subparagraphs (J)(i) and (ii) and (K) of this paragraph and paragraph (6)(C) of this subsection.

(i) Protective devices shall be of no less than 0.25 millimeter (mm) lead equivalent material except as specified in paragraph (6)(C)(ii)(I) of this subsection.

§289.233(i)(3)(H)(ii)

(ii) 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 in accordance with subsection (j)(2) of this section for inspection by the agency.

(I) Exposure of individuals other than the animal. 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.

(J) Holding of animal or image receptor.

(i) 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.

(ii) If an animal or image receptor must be held by an individual during an exposure, that individual shall be protected with appropriate shielding devices described in subparagraph (H) of this paragraph.

(iii) The registrant's written operating and safety procedures required by paragraph (2) of this subsection shall include the following:

Don't hold an animal or image receptor unless mechanical holders cannot be used.

If you must hold an animal or image receptor on occasion, keep procedures for doing this in your operating and safety procedures.

§289.233(i)(3)(J)(iii)(I)

(I) a list of circumstances in which mechanical holding devices cannot be routinely utilized; and

(II) a procedure used for selecting an individual to hold or support the animal or image receptor.

(K) Operator position. 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 radiation machine or protected by an apron, gloves, or other shielding having a minimum of 0.25 lead equivalent material.

(L) Holding of tube. In no case shall an individual hold the tube or tube housing assembly supports during any radiographic exposure.

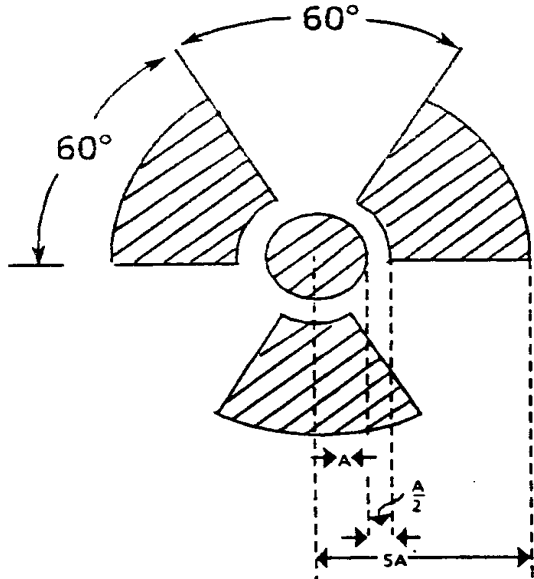
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(4) Facility requirements.

(A) Caution signs. Unless otherwise authorized by the agency, the standard radiation symbol prescribed shall use the colors magenta, or purple, or black on yellow background. The standard radiation symbol prescribed is the three-bladed design as follows:



(i) the cross-hatched area of the symbol is to be magenta, or purple, or black; and

(ii) the background of the symbol is to be yellow.

(B) Posting of notices to workers.

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This is a radiation symbol.

Post the room where the x-ray machine is located with a sign that has the radiation symbol and the words: "CAUTION, RADIATION AREA."

However, if someone is in continuous control of the room and the x-ray machine, then caution signs don't have to be posted.

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§289.233(i)(4)(B)(i)

(i) Each registrant shall post current copies of the following documents:

(I) §289.233 of this title;

(II) the certificate of registration and conditions or documents incorporated into the certificate of registration by reference, and amendments thereto;

(III) the operating procedures applicable to work under the certificate of registration; and

(IV) any notice of violation, if applicable, involving radiological working conditions, or order issued in accordance with subsection (k)(2) of this section.

(ii) If posting of a document specified in clause (i) of this subparagraph is not practicable, the registrant shall post a notice that describes the document and states where it may be examined.

(iii) **The following form, BRC** Form 233-2, "Notice to Employees," which is found at the end of the section, or an equivalent document containing at least the same wording as BRC Form 233-2.

(iv) Documents, notices, or forms posted in accordance with this subsection shall:

Post a note stating where employees can find these documents:

- **current rules**
- **operating and safety procedures**
- **certificate of registration**
- **last notice of violation from the agency**

Post the "Notice to Employees," BRC Form 233-2, where all employees can see it. This form is located at the end of this rule or can be downloaded at:

www.dshs.state.tx.us/radiation/rules.shtm

§289.233(i)(4)(B)(iv)(I)

(I) appear in a sufficient number of places to permit individuals engaged in work under the certificate of registration to observe them on the way to or from any particular work location to which the document applies;

(II) be conspicuous; and

(III) be replaced if defaced or altered.

(C) Posting requirements.

(i) The registrant shall post each radiation area with a conspicuous sign or signs bearing the radiation symbol and the words "CAUTION, RADIATION AREA."

(ii) The registrant shall post each high radiation area with a conspicuous sign or signs bearing the radiation symbol and the words "CAUTION, HIGH RADIATION AREA" or "DANGER, HIGH RADIATION AREA."

(iii) The registrant shall post each very high radiation area with a conspicuous sign or signs bearing the radiation symbol and words "GRAVE DANGER, VERY HIGH RADIATION AREA."

(D) Exceptions to posting requirements. A registrant is not required to post caution signs in areas or rooms containing radiation machines for periods of less than 8 hours, if each of the following conditions is met:

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(i) the radiation machines are constantly attended during these periods by an individual who takes the precautions necessary to prevent the exposure of individuals to radiation in excess of the limits established in this section; and

(ii) the area or room is subject to the registrant's control.

(E) General surveys and monitoring.

(i) Each registrant shall make, or cause to be made, surveys that:

(I) are necessary for the registrant to comply with this section; and

(II) are necessary under the circumstances to evaluate:

(-a-) the magnitude and extent of radiation levels; and

(-b-) the potential radiological hazards.

(ii) The registrant shall ensure that instruments and equipment used for qualitative and quantitative radiation measurements, for example, dose rate, are operable and calibrated:

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§289.233(i)(4)(E)(ii)(I)

(I) by a person licensed or registered by the agency, another agreement state, a licensing state, or the United States Nuclear Regulatory Commission to perform such service;

(II) at intervals not to exceed 12 months unless a different time interval is specified in another section of this chapter;

(III) after each instrument or equipment repair;

(IV) for the types of radiation used and at energies appropriate for use; and

(V) at an accuracy within 20% of the true radiation level.

(iii) All individual monitoring devices, except for direct and indirect reading pocket dosimeters, electronic personal dosimeters, and those individual monitoring devices used to measure the dose to any extremity, that require processing to determine the radiation dose and that are used by registrants to comply with subparagraph (A) of this paragraph, with other applicable provisions of this chapter, shall be processed and evaluated by a dosimetry processor:

(I) holding current personnel dosimetry accreditation from the National Voluntary Laboratory Accreditation Program (NVLAP) of the National Institute of Standards and Technology; and

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(II) approved in this accreditation process for the type of radiation or radiations included in the NVLAP program that most closely approximates the type of radiation or radiations for which the individual wearing the dosimeter is monitored.

(F) Control of access to high radiation areas.

(i) The registrant shall ensure that each entrance or access point to a high radiation area has one or more of the following features:

(I) a control device that, upon entry into the area, causes the level of radiation to be reduced below that level at which an individual might receive a DDE of 0.1 rem (1 mSv) in one hour at 30 cm from the source of radiation from any surface that the radiation penetrates;

(II) a control device that energizes a conspicuous visible or audible alarm signal so that the individual entering the high radiation area and the supervisor of the activity are made aware of the entry; or

(III) entryways that are locked, except during periods when access to the areas is required, with positive control over each individual entry.

(ii) In place of the controls required by clause (i) of this subparagraph for a high radiation area, the registrant may substitute continuous direct or electronic surveillance that is capable of preventing unauthorized entry.

You must control access to high radiation areas.

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§289.233(i)(4)(F)(iii)

(iii) The registrant may apply to the agency for approval of alternative methods for controlling access to high radiation areas.

(iv) The registrant shall establish the controls required by clauses (i) and (iii) of this subparagraph in a way that does not prevent individuals from leaving a high radiation area.

(G) Control of access to very high radiation areas.

(i) In addition to the requirements in subparagraph (F) of this paragraph, the registrant shall institute measures to ensure that an individual is not able to gain unauthorized or inadvertent access to areas in which radiation levels could be encountered at 500 rads (5 grays) or more in one hour at 1 m from a radiation machine or any surface through which the radiation penetrates at this level.

(ii) The entry control devices required by clause (i) of this subparagraph shall be established in such a way that no individual will be prevented from leaving the area.

(H) Security and control of radiation machines.

(i) The registrant shall secure radiation machines from unauthorized removal.

(ii) The registrant shall use devices and/or administrative procedures to prevent unauthorized use of radiation machines.

You must control access to very high radiation areas.

You must ensure security and control of x-ray machines.

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(5) Radiation Machine Requirements.

(A) Technique chart. A technique chart relevant to the particular radiation machine shall be provided or electronically displayed in the vicinity of the control panel and used by all operators.

(B) Labeling radiation machines. Each registrant shall ensure that each radiation machine is labeled in a conspicuous manner that cautions individuals that radiation is produced when it is energized. This label shall be affixed in a clearly visible location on the face of the control unit.

(C) Mechanical support of tube head. The tube housing assembly shall be adjusted to remain stable during an exposure unless tube housing movement is a designed function of the x-ray system.

(D) Battery charge indicator. On battery-powered x-ray generators, visual means shall be provided on the control panel to indicate whether the battery is in a state of charge adequate for proper operation.

(E) Beam quality. The following requirements apply to beam quality.

(i) Half-value layer.

You must have a technique chart for each x-ray machine and follow that chart.

The x-ray machine control panel must have a label that says x-rays are produced when the machine is on.

§289.233(i)(5)(E)(i)(I)

(I) The half-value layer of the useful beam for a given x-ray tube potential shall not be less than the values shown in the following Table I. If it is necessary to determine such half-value layer at an x-ray tube potential that is not listed in Table I, linear interpolation may be made.

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The x-ray beam must be filtered. Most veterinary x-ray machines are manufactured with the correct filters.

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TABLE I. HALF-VALUE LAYER FOR SELECTED kVp

X-ray tube voltage (kilovolt peak)	Measure Half-Value Layer (millimeters of aluminum)	
Designed operating range	Measured operating potential	
Below 51 -----	30	0.3
	40	0.4
	50	0.5
51 to 70 -----	51	1.2
	60	1.3
	70	1.5
Above 70 -----	71	2.1
	80	2.3
	90	2.5
	100	2.7
	110	3.0
	120	3.2
	130	3.5
	140	3.8
	150	4.1

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§289.233(i)(5)(E)(i)(II)

(II) For capacitor energy storage equipment, compliance with the requirements of subparagraph (I) of this paragraph shall be determined with the maximum quantity of charge per exposure.

(ii) Filtration controls.

(I) For x-ray systems that have variable kVp and variable filtration for the useful beam, a device shall link the kVp selector with the filters and shall prevent an exposure unless the minimum amount of filtration required by subparagraph (A) of this paragraph is in the useful beam for the given kVp that has been selected.

(II) Any other system having removable filters shall be required to have the minimum amount of filtration as required by subparagraph (E)(i)(I) of this paragraph permanently located in the useful beam during each exposure.

(F) Multiple tubes. Where two or more radiographic tubes are controlled by one exposure switch, the tube or tubes that have been selected shall be clearly indicated prior to initiation of the exposure. This indication shall be both on the x-ray control panel and at or near the tube housing assembly that has been selected.

(G) Technique and exposure indicators.

(i) 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.

If your x-ray machine has more than one tube head, the control panel and the tube head must show which tube head is being used.

§289.233(i)(5)(G)(ii)

(ii) On machines having fixed technique factors, the requirement of subparagraph (A) of this paragraph may be met by permanent markings.

(iii) The x-ray control shall provide visual or audible indication of the production of x-rays observable at or from the operator's protected position whenever x-rays are produced.

(iv) 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 to within plus or minus 10% of the indicated setting.

(H) Beam limiting devices. Beam limiting devices shall do the following:

(i) provide the same degree of protection as is required of the housing;

(ii) restrict the useful beam to the area of clinical interest;

(iii) the numerical SID indicator shall be present and shall be accurate to within 2.0% of the SID;

(iv) limit the x-ray field such that the x-ray field shall not exceed:

(I) 2.0% of the SID for the length or width of the rectangular image receptor; or

The x-ray machine control panel must show when x-rays are produced.

(II) 2.0% of the SID for the diagonal of the image receptor; and

(v) A means shall be provided to center the primary beam to the image receptor within 2.0% of the SID.

(I) Means for terminating exposure.

(i) A means shall be provided to terminate the exposure at the following:

(I) a preset time interval

(II) a preset product of current and time;

(III) a preset number of pulses; or

(IV) a preset radiation exposure to the image receptor.

(ii) The radiation machine shall not be able to make an exposure when the timer is set to a "zero" or "off" position if either position is provided.

(J) Stationary or portable x-ray systems. All stationary or portable x-ray systems used for veterinary x-ray shall be provided with the following:

§289.233(i)(5)(J)(i)

(i) a continuous pressure type exposure switch; and

(ii) either a six and one-half foot high protective barrier for operator protection during exposures; or

(iii) a means for the operator to be at least six feet from the tube housing assembly.

(K) Hand-held portable radiation machines. Operators using portable radiation machines designed to be hand-held are exempt from the requirements of subparagraph (J) his paragraph. The hand-held portable radiation machine shall be held by the tube housing support or handle. The operator shall wear protective devices in accordance with paragraph (3)(H) of this subsection.

(L) Portable radiation machines. Portable machines should comply with the requirements in subparagraph (H) of this paragraph, as applicable, based on manufacture's design.

(M) Exams and retakes. All exams and retakes shall be ordered by the veterinarian.

(N) Equipment performance evaluations.

§289.233(i)(5)(N)(i)

(i) For all radiographic machines used in veterinary medicine, the registrant shall perform, or cause to be performed, tests necessary to assure proper function of equipment with the indicated standard for each of the following items. These tests shall be performed each time the registrant is requested by the agency to submit the equipment performance evaluations with the remote inspection form. The tests listed shall also be performed after each machine installation.

(I) Timer.

(-a-) The accuracy of the timer shall meet the manufacturer's specifications. If the manufacturer's specifications are not obtainable, the timer accuracy shall be plus or minus 10% of the indicated time with testing performed at 0.5 second.

(-b-) Means shall be provided to terminate the exposure at a preset time interval, a preset product of current and time, a preset number of pulses, or a preset radiation exposure to the image receptor. In addition, it shall not be possible to make an exposure when the timer is set to a "zero" or "off" position if either position is provided.

You must test these equipment performance evaluation items each time the agency requests that you submit the remote inspection form and after each machine installation:

- **timer**
- **kVp**
- **tube stability**
- **collimation**

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§289.233(i)(5)(N)(i)(II)

(II) Kilovolt peak. If the registrant possesses documentation of the appropriate manufacturer's kilovolt peak specifications, the radiation machine shall meet those specifications. If the registrant does not possess documentation of the appropriate manufacturer's kilovolt peak specifications, the indicated kilovolt peak shall be accurate to within plus or minus 10% of the indicated setting(s). For radiation machines with fewer than three fixed kilovolt peak settings, the radiation machine shall be checked at those settings.

(III) Tube stability. The x-ray tube shall remain physically stable during exposures. In cases where tubes are designed to move during exposure, the registrant shall assure proper and free movement of the radiation machine.

(IV) Collimation. Field limitation shall meet the requirements for beam-limiting devices of subparagraph (H) of this paragraph.

(ii) Records of the test results, including any numerical readings shall be maintained by the registrant in accordance with subsection (j)(2) of this section.

Keep a record of these tests.

§289.233(i)(5)(N)(iii)

(iii) Any items not meeting the specifications of the tests shall be corrected or repaired. Correction or repair shall begin within 30 days following the check and shall be performed according to a plan designated by the registrant. Correction or repair shall be completed no longer than 90 days from discovery unless authorized by the agency. Records of corrections or repairs shall be maintained by the registrant in accordance with subsection (j)(2) of this section for inspection by the agency.

(iv) Measurements of the radiation output of an x-ray system shall be performed with a calibrated dosimetry system. The dosimetry system shall have been calibrated within the preceding 24 months and the calibration shall be traceable to a national standard. During the calendar year in which the dosimetry system is not calibrated, an intercomparison to a system calibrated within the previous 12 months shall be performed.

(v) Fluoroscopic x-ray systems shall comply with the additional requirements specified in paragraph (6) of this subsection.

(6) Additional requirements for fluoroscopic x-ray systems.

(A) Limitation of the useful beam. Limitation of the useful beam shall be as follows.

(i) Primary barrier.

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Begin to correct any item that fails a test and complete the correction in 90 days. Keep a record of your corrections.

If you use a fluoroscopic x-ray system, these requirements apply to you:

- **limitation of the useful beam**
- **activation of the fluoroscopic tube**
- **control of scattered radiation**

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§289.233(i)(6)(A)(i)(I)

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

(II) The x-ray tube used for fluoroscopy shall not produce x rays unless the barrier is in position to intercept the useful beam and the imaging device is in place and operable.

(III) The exposure rate due to transmission through the barrier with the attenuation block in the useful beam, combined with radiation through the image intensifier if provided, shall not exceed $3.34 \times 10^{-3}\%$ of the entrance exposure rate at a distance of 10 cm from any accessible surface of the fluoroscopic imaging assembly beyond the plane of the image receptor.

(ii) Measuring compliance of barrier transmission.

(I) The exposure rate due to transmission through the primary protective barrier combined with radiation through the image intensifier shall be determined by measurements averaged over an area of 100 cm^2 with no linear dimension greater than 20 cm.

(II) If the source is below the tabletop, the measurement shall be made with the input surface of the fluoroscopic imaging assembly positioned 30 cm above the tabletop.

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(III) If the source is above the tabletop and the SID is variable, the measurement shall be made with the end of the beam-limiting device or spacer as close to the tabletop as it can be placed, provided that it shall not be closer than 30 cm.

(IV) Movable grids and compression devices shall be removed from the useful beam during the measurement.

(V) The attenuation block shall be positioned in the useful beam 10 cm from the point of measurement of entrance exposure rate and between this point and the input surface of the fluoroscopic imaging assembly.

(VI) The collimator shall be fully open when the measurement is made.

(iii) X-ray field.

(I) Compliance with subclauses (II)-(VII) of this clause shall be determined with the beam axis perpendicular to the plane of the image receptor.

(II) Equipment with a fixed SID and the capability of a visible area of no greater than 300 cm² shall be provided with either stepless adjustment of the x-ray field or a means to further limit the x-ray field at the image receptor to 125 cm² or less. If the equipment is provided with stepless adjustment, the minimum x-ray field size at the maximum SID shall be less than or equal to 5 cm by 5 cm at the image receptor.

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§289.233(i)(6)(A)(iii)(III)

(III) Equipment with a variable SID or a fixed SID with the capability of a visible area of greater than 300 cm² shall be provided with stepless adjustment of the field size. The minimum x-ray field size at the maximum SID shall be less than or equal to 5 cm by 5 cm at the image receptor.

(IV) Neither the length nor the width of the x-ray field in the plane of the image receptor shall exceed that of the visible area of the image receptor by more than 3.0% of the SID. The sum of the excess length and the excess width shall be no greater than 4.0% of the SID.

(V) For rectangular x-ray fields used with circular image receptors, the error in alignment shall be determined along the length and width dimensions of the x-ray field that pass through the center of the visible area of the image receptor.

(VI) For fluoroscopic equipment with only a manual mode of collimation, the x-ray field produced shall be limited to the area of the spot-film cassette at 16 inches above tabletop. Additionally, during fluoroscopy, the beam shall be restricted to the area of the input phosphor.

(VII) Spot-film devices shall meet the following additional requirements.

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§289.233(i)(6)(A)(iii)(VII)(-a-)

(-a-) Means shall be provided between the source and the animal for adjustment of the x-ray field size in the plane of the film to the size of that portion of the film that has been selected on the spot-film selector.

(-1-) Such adjustment shall be automatically accomplished except when the x-ray field size in the plane of the film is smaller than that of the selected portion of the film.

(-2-) The total misalignment of the edges of the x-ray field with the respective edges of the selected portion of the image receptor along the length or width dimensions of the x-ray field in the plane of the image receptor shall not exceed 3.0% of the SID when adjusted for full coverage of the selected portion of the image receptor.

(-3-) The sum, without regard to sign of the misalignment along any two orthogonal dimensions, shall not exceed 4.0% of the SID.

(-b-) The center of the x-ray field in the plane of the film shall be aligned with the center of the selected portion of the film to within 2.0% of the SID.

§289.233(i)(6)(B)

(B) Activation of the fluoroscopic tube. X-ray production in the fluoroscopic mode shall be controlled by a device that requires continuous pressure by the fluoroscopist for the entire time of the exposure (continuous pressure type switch). When recording serial fluoroscopic images, the fluoroscopist shall be able to terminate the x-ray exposures at any time, but means may be provided to permit completion of any single exposure of the series in process.

(C) Control of scattered radiation.

(i) Fluoroscopic configuration, including fluoroscopic table designs, shall not permit any portion of any individual's body, except the head, neck, and extremities, to be exposed to scattered radiation emanating from above or below the tabletop unless the radiation has passed through not less than a total of 0.25 mm lead equivalent material. The material may be, but is not limited to, drapes, self-supporting curtains, or viewing shields, in addition to any lead equivalency provided by a protective apron.

(ii) Where sterile fields or special procedures prohibit the use of normal protective barriers or drapes, all of the following conditions shall be met.

(I) All persons in the room where fluoroscopy is performed shall wear protective aprons that provide a shielding equivalent of 0.5 mm of lead.

(II) The fluoroscopic field size shall be reduced to the absolute minimum required for the procedure being performed (area of clinical interest).

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§289.233(i)(6)(C)(ii)(III)

(III) Operating and safety procedures shall reflect the above conditions, and fluoroscopy personnel shall exhibit awareness of situations requiring the use and/or nonuse of the protective drapes.

(iii) For image-intensified fluoroscopic equipment with only a manual mode of collimation, the x-ray field produced shall be limited to the area of the spot-film cassette at 16 inches above tabletop. Additionally, during fluoroscopy, the beam shall be restricted to the area of the input phosphor.

(7) Additional requirements for CT x-ray systems.

(A) Initiation of operation.

(i) The x-ray control and gantry shall provide visual indication whenever x rays are produced and, if applicable, whether the shutter is open or closed.

(ii) Means shall be provided to require operator initiation of each individual scan or series of scans.

(iii) All emergency buttons/switches shall be clearly labeled as to their functions.

(B) Termination of exposure.

If you use a CT x-ray system, these requirements apply to you:

- **initiation of operation**
- **termination of exposure**

§289.233(i)(7)(B)(i)

(i) Means shall be provided to terminate the x-ray exposure automatically by either de-energizing the x-ray source or shuttering the x-ray beam in the event of equipment failure affecting data collection. Such termination shall occur within an interval that limits the total scan time to no more than 110% of its preset value through the use of either a backup timer or devices that monitor equipment function.

(ii) A signal visible to the operator shall indicate when the x-ray exposure has been terminated through the means required by clause (i) of this subparagraph.

(iii) The operator shall be able to terminate the x-ray exposure at any time during a scan or series of scans under CT x-ray system control of greater than 0.5 seconds duration. Termination of the x-ray exposure shall necessitate resetting of the CT conditions of operation prior to initiation of another scan.

(8) Educational facilities. Facilities conducting training using animals are held to the requirements of this section except for paragraphs (9)-(11) of this subsection concerning film processing.

(9) Automatic and manual film processing for veterinary facilities and mobile veterinary services.

If your x-ray machine is in an educational facility, only some of these requirements apply.

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§289.233(i)(9)(A)

(A) 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 an alternate time-temperature relationship is more appropriate for a specific facility, that time-temperature relationship shall be documented and posted.

(B) Chemicals shall be replaced according to the chemical manufacturer's or supplier's recommendations or at an interval not to exceed three months.

(C) Darkroom light leak tests shall be performed and any light leaks corrected at intervals not to exceed six months.

(D) 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.

(E) Corrections or repairs of the light leaks or other deficiencies in paragraphs (2)-(4) of this subsection shall be initiated within 72 hours of discovery and completed no longer than 15 days from detection of the deficiency unless a longer time is 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 in accordance with subsection (t)(1) of this section for inspection by the agency.

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Use the time and temperature recommended by the film manufacturer when you process x-ray films.

If you process your films at a different time and temperature, write it down and post it.

Change your chemicals at the times recommended by the manufacturer or supplier or at least every 3 months.

If you have a darkroom, check for light leaks at least every 6 months and fix any you find.

If you have a darkroom, use the correct filter, bulb wattage, and distance recommended by the film manufacturer.

Keep a record of when you changed chemicals, when you checked for light leaks and repairs of light leaks.

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§289.233(i)(9)(F)

(F) Documentation of the items in subparagraphs (B), (C), and (E) of this paragraph shall be maintained at the site where performed and shall include the date and initials of the individual completing these items. These records shall be made and maintained in accordance with subsection (j)(2) of this section for inspection by the agency.

(10) Alternative processing systems. Users of daylight processing systems, laser processors, self-processing film units, or other alternative processing systems shall follow manufacturer's recommendations for image processing. Documentation that the registrant is following manufacturer's recommendations shall include the date and initials of the individual completing the document and shall be maintained at the site where performed in accordance with subsection (j)(2) of this section for inspection by the agency.

(11) Digital imaging acquisition systems. Users of digital imaging acquisition systems shall follow quality assurance/quality control protocol for image processing established by the manufacturer, or if no manufacturer's protocol is available, by the registrant. The registrant shall include the protocols, whether established by the registrant or the manufacturer, in its operating and safety procedures. The registrant shall document the frequency at which the quality assurance/quality control protocol is performed. Documentation shall include the date and initials of the individual completing the document and shall be maintained at the site where performed in accordance with subsection (j)(2) of this section for inspection by the agency.

(j) Records and reports.

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If you have any other kind of film processing system besides a darkroom, follow the manufacturer's instructions for processing.

If you have a digital imaging system, follow the quality assurance/quality control protocols provided by the manufacturer. However if the manufacturer does not provide protocols, then you must develop your own.

You must keep the protocols in your operating and safety procedures.

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(1) General provisions for records and reports.

(A) Each registrant shall maintain records at each site including sites authorized by certificate of registration condition and records sites for mobile services. The records shall include those specified in paragraph (2) of this subsection and shall be maintained at the time interval indicated for inspection by the agency. Additional record requirements are specified elsewhere in this chapter. All records required by this chapter shall be accurate and factual.

(B) Records are only valid if stamped, initialed, or signed and dated by authorized personnel or otherwise authenticated. Records such as letters, drawings, and specifications, shall include all pertinent information, such as stamps, initials, and signatures.

(C) Each registrant shall use the SI units gray, sievert, and coulomb per kilogram, or the special units rad, rem, and roentgen, including multiples and subdivisions, and shall clearly indicate the units of all quantities on records required by this chapter.

(D) The registrant shall make a clear distinction among the quantities entered on the records required by this section, such as TEDE, SDE, LDE, or DDE.

(E) Each record required by this section shall be legible throughout the specified retention period.

Your records must be accurate and be signed and dated.

§289.233(j)(1)(F)

(F) The record shall be the original or a reproduced copy or a microform, provided that the copy or microform is authenticated by authorized personnel and that the microform is capable of producing a clear copy throughout the required retention period.

(G) The record may also be stored in electronic format with the capability for producing legible, accurate, and complete records during the required retention period.

(H) Each registrant shall maintain records of receipt, transfer, and disposal of radiation machines for inspection by the agency. The records shall include the following information and shall be kept until disposal is authorized by the agency:

(i) manufacturer's name;

(ii) model and serial number from the control panel;

(iii) date of the receipt, transfer, and disposal; and

(iv) name of the individual recording the information.

(I) The registrant shall maintain adequate safeguards against tampering with and loss of records.

You may keep your records in an electronic format.

§289.233(j)(1)(J)

(J) Subject to the limitations provided in the Texas Public Information Act, Government Code, Chapter 552, all information and data collected, assembled, or maintained by the agency are public records open to inspection and copying during regular office hours.

(K) Any person who submits written information or data to the agency and requests that the information be considered confidential, privileged, or otherwise not available to the public under the Texas Public Information Act, shall justify such request in writing, including statutes and cases where applicable, addressed to the agency.

(i) Documents containing information that is claimed to fall within an exception to the Texas Public Information Act shall be marked to indicate that fact. Markings shall be placed on the document on origination or submission.

(I) The words "NOT AN OPEN RECORD" shall be placed conspicuously at the top and bottom of each page containing information claimed to fall within one of the exceptions.

(II) The following wording shall be placed at the bottom of the front cover and title page, or first page of text if there is no front cover or title page:

All records sent to the agency are available to the public except for certain information justified to be kept confidential.

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§289.233(j)(1)(K)(i)(II)

"INFORMATION FALLING WITHIN EXCEPTION OF THE TEXAS PUBLIC INFORMATION ACT, GOVERNMENT CODE, CHAPTER 552 ---- CONFIDENTIAL

This document contains information submitted to the Department of State Health Services, Radiation Control by

(Name of Company)(Name of Submitter)

which is claimed to fall within the following exception to the Texas Public Information Act, Government Code, Chapter 552, Subchapter C _____

(Appropriate Subsection)

WITHHOLD FROM PUBLIC DISCLOSURE

(Signature and Title)(Office)(Date)"

(ii) The agency requests, whenever possible, that all information submitted under the claim of an exception to the Texas Public Information Act be extracted from the main body of the application and submitted as a separate annex or appendix to the application.

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§289.233(j)(1)(K)(iii)

(iii) Failure to comply with any of the procedures described in clauses (i) and (ii) of this subparagraph may result in all information in the agency file being disclosed upon an open records request.

(L) The agency will determine whether information falls within one of the exceptions to the Texas Public Information Act. The agency will determine whether or not there has been a previous determination that the information falls within one of the exceptions to the Texas Public Information Act. If there has been no previous determination and the agency believes that the information falls within one of the exceptions, an opinion of the Attorney General will be requested. If the agency agrees in writing to the request, the information shall not be open for public inspection unless the Attorney General's office subsequently determines that it does not fall within an exception.

(M) Requests for information.

(i) All requests for open records information must be in writing and refer to documents currently in possession of the agency.

(ii) The agency will ascertain whether the information may be released or whether it falls within an exception to the Texas Public Information Act.

(I) The agency may take a reasonable period of time to determine whether information falls within one of the exceptions to the Texas Public Information Act.

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§289.233(j)(1)(M)(ii)(II)

(II) If the information is determined to be public, it will be presented for inspection and/or copies of documents will be furnished within a reasonable period of time. A fee will be charged to recover agency costs for copies.

(iii) Original copies of public records may not be removed from the agency. Under no circumstances shall material be removed from existing records.

(N) Records of surveys.

(i) Each registrant shall make and maintain records showing the results of surveys required by subsection (i)(4)(E) of this section for inspection by the agency. The registrant shall retain these records in accordance with subsection (j)(2) of this section.

(ii) The registrant shall retain the results of surveys to determine the dose from external sources of radiation used, in the absence of or in combination with individual monitoring data, in the assessment of individual DEs in accordance with subsection (j)(2) of this section.

(O) Records of individual monitoring results.

§289.233(j)(1)(O)(i)

(i) Each registrant shall make or cause to be made and maintain records in accordance with subsection (i)(3)(F) of this section of the doses received by all individuals for whom monitoring was required in accordance with subsection (i)(3)(B) of this section, and records of doses received during accidents, and emergency conditions. Assessments of DE and records made using units in effect before January 1, 1994, need not be changed. These records shall include, when applicable:

(I) the DDE to the whole body, LDE, SDE to the skin of the whole body, and SDE to the skin of any extremities; and

(II) the data used to make occupational dose assessments in accordance with subsection (i)(3)(F)(v) of this section.

(ii) The registrant shall make entries of the records specified in clause (i) of this subparagraph at intervals not to exceed one year and within 90 days of the end of the year.

(iii) The registrant shall make or cause to be made and maintain the records specified in clause (i) of this subparagraph on BRC Form 233-1, in accordance with the instructions for BRC Form 233-1, or in clear and legible records containing all the information required by BRC Form 233-1.

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§289.233(j)(1)(O)(iv)

(iv) The registrant shall make or cause to be made and maintain the records of dose to an embryo/fetus with the records of dose to the declared pregnant woman. The declaration of pregnancy, including the estimated date of conception, shall also be kept on file, but may be maintained separately from the dose records.

(v) The registrant shall retain each required form or record required by this subsection in accordance with subsection (j)(2) of this section for inspection by the agency. The registrant shall retain records used in preparing BRC Form 233-1 or equivalent in accordance with subsection (j)(2) of this section.

(P) Records of dose to individual members of the public.

(i) Each registrant shall make and maintain records sufficient to demonstrate compliance with the dose limit for individual members of the public for inspection by the agency. See subsection (i)(3)(C) and (D) of this section.

(ii) The registrant shall retain the records required by clause (i) of this subparagraph in accordance with subsection (j)(2) of this section.

(2) Record/document requirements. Each registrant shall maintain the following records/documents at each site, including authorized records sites for mobile services at the time intervals specified and make available to the agency for inspection.

Keep the records listed in the record keeping chart on pages 233-100 through 102 to show the agency inspector.

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§289.233(j)(2)

Name of Records/Documents	Specific Rule Subsection	Time Interval for Keeping Records/Documents
(A) Current 25 TAC §289.233	As listed on certificate of registration	Until termination of registration
(B) Inventory of all radiation machines possessed	(h)(5)(A)	5 years
(C) Current operating and safety procedures	(i)(2)	Until termination of registration
Documentation that all staff who operate the radiation machine(s) have read this document		Until next on-site inspection
(D) Surveys (public dose evaluation)	(i)(3)(C)	Until termination of registration
(E) Occupational dose assessment and administrative control records	(i)(3)(F)(vi)	Until termination of registration
(F) Current certificate of registration	(i)(4)(B)(i)(II)	Until termination of registration

The first column lists the record/documents you need to have ready when the agency inspector visits your facility for an inspection.

The second column states where in this rule text you are required to make/document these records/documents.

The third column tells you how long you have to keep the records/document.

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§289.233(j)(2)

Name of Records/Documents	Specific Rule Subsection	Time Interval for Keeping Records/Documents
(G) Notice of violation from last inspection, if applicable	(i)(4)(B)(i)(IV)	Until next on-site inspection
(H) Documentation of correction of any violations	(i)(4)(B)(i)(IV)	Until next on-site inspection
(I) Protective devices annual check	(i)(5)(D)(ii)	5 years
(J) Equipment performance evaluations	(i)(5)(N)(ii)	5 years
(K) Film processing records and corrections	(i)(9)(F)	5 years
(L) Alternate processing systems records	(i)(10)	5 years
(M) Digital imaging acquisition systems records	(i)(10)	5 years
(N) Receipt, transfer, and disposal	(j)(1)(A)	Until termination of registration

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§289.233(j)(2)

Name of Records/Documents	Specific Rule Subsection	Time Interval for Keeping Records/Documents
(O) Records at Additional Authorized Use/Storage Locations	(j)(1)(A)	While site is authorized on registration
(P) Surveys, Measurements, Calibrations Used for Dose Determination	(j)(1)(N)(ii)	Until termination of registration
(Q) Individual Monitoring Records	(j)(1)(O)	Until termination of registration
(R) Occupational Dose Results, BRC Form 233-1	(j)(1)(O)(i)-(iii)	Updated annually; Maintain until termination of registration
(S) Embryo/Fetus Dose	(j)(1)(O)(iv)	Until termination of registration
(T) Records Used to Prepare BRC Form 233-1	(j)(1)(O)(v)	5 years
(U) Dose to Individual Members of the Public	(j)(1)(P)	Until termination of registration

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(3) Reports.

(A) Reports of stolen, lost, or missing radiation machines.

(i) Each registrant shall report to the agency by telephone a stolen, lost, or missing radiation machine immediately after its occurrence becomes known to the registrant.

(ii) Each registrant required to make a report in accordance with clause (i) of this subparagraph shall, within 30 days after making the telephone report, make a written report to the agency that includes the following information:

(I) a description of the radiation machine involved, including, the manufacturer and model and serial number;

(II) a description of the circumstances under which the loss or theft occurred;

(III) a statement of disposition, or probable disposition, of the radiation machine involved;

(IV) exposures of individuals to radiation, circumstances under which the exposures occurred, and the possible TEDE to persons in unrestricted areas;

(V) actions that have been taken, or will be taken, to recover the radiation machine; and

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If your x-ray machine is lost or stolen, you must tell the agency immediately by telephone.

Within 30 days from your telephone call, send the agency a written report that includes these details:

- **manufacturer's name, model and serial number**
- **how the machine was lost or stolen**
- **what happened to the machine**
- **what you have done to prevent it from happening again**

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§289.233(j)(3)(A)(ii)(VI)

(VI) procedures or measures that have been, or will be, adopted to ensure against a recurrence of the loss or theft of radiation machines.

(iii) Subsequent to filing the written report, the registrant shall also report additional substantive information on the loss or theft within 30 days after the registrant learns of such information.

(iv) The registrant shall prepare any report filed with the agency in accordance with this subsection so that names of individuals who may have received exposure to radiation are stated in a separate and detachable portion of the report.

(B) Reports of incidents.

(i) Notwithstanding other requirements for notification, each registrant shall immediately report each event involving a radiation machine possessed by the registrant that may have caused or threatens to cause an individual to receive:

(I) a TEDE of 25 rems (0.25 Sv) or more;

(II) an LDE of 75 rems (0.75 Sv) or more; or

(III) an SDE to the skin of the whole body or to the skin of any extremities of 250 rads (2.5 grays) or more.

Reports any event to the agency if a machine has caused an overexposure.

§289.233(j)(3)(B)(ii)

(ii) Each registrant shall, within 24 hours of discovery of the event, report to the agency each event involving loss of control of a radiation machine possessed by the registrant that may have caused, or threatens to cause an individual to receive, in a period of 24 hours:

(I) a TEDE exceeding 5 rems (0.05 Sv);

(II) an LDE exceeding 15 rems (0.15 Sv); or

(III) an SDE to the skin of the whole body or to the skin of any extremities exceeding 50 rems (0.5 Sv).

(iii) Registrants shall make the initial notification reports required by clauses (i) and (ii) of this subparagraph by telephone to the agency and shall confirm the initial notification report within 24 hours by telegram, mailgram, or facsimile to the agency.

(iv) The registrant shall prepare each report filed with the agency in accordance with this section so that names of individuals who have received exposure to radiation are stated in a separate and detachable portion of the report.

(C) Reports of exposures and radiation levels exceeding the limits.

Report to the agency within 24 hours of discovering that a machine is lost and may cause an overexposure to individuals.

Make the initial report by telephone and confirmation of that report by telegram, mailgram, or fax to the agency.

§289.233(j)(3)(C)(i)

(i) In addition to the notification required by subparagraph (B) of this paragraph, each registrant shall submit a written report within 30 days after learning of any of the following occurrences:

(I) incidents for which notification is required by subparagraph (B) of this paragraph;

(II) doses in excess of any of the following:

(-a-) the occupational dose limits for adults in subsection (i)(3)(A)(i)(I) of this section;

(-b-) the occupational dose limits for a minor in subsection (i)(3)(A)(i)(III) of this section;

(-c-) the limits for an embryo/fetus of a declared pregnant woman in subsection (i)(3)(A)(i)(IV) of this section;

(-d-) the limits for an individual member of the public in subsection (i)(3)(C) of this section; or

(-e-) any applicable limit in the **certificate of** registration;

(III) levels of radiation in:

§289.233(j)(3)(C)(i)(III)(-a-)

(-a-) a restricted area in excess of applicable limits in the certificate of registration; or

(-b-) an unrestricted area in excess of 10 times the applicable limit set forth in this section or in the registration, whether or not involving exposure of any individual in excess of the limits in subsection (i)(3)(C) of this section.

(ii) Each report required by clause (i) of this subparagraph shall describe the extent of exposure of individuals to radiation, including, as appropriate:

dose;

(I) estimates of each individual's

(II) the levels of radiation involved;

exposures, dose rates; and

(III) the cause of the elevated

(IV) corrective steps taken or planned to ensure against a recurrence, including the schedule for achieving conformance with applicable limits, and associated registration conditions.

(iii) Each report filed in accordance with clause (i) of this subparagraph shall include for each individual exposed: the name, a unique identification number, and date of birth. With respect to the limit for the embryo/fetus in subsection (i)(3)(A)(i)(IV) of this section, the identifiers should be those of the declared pregnant woman. The report shall be prepared so that this information is stated in a separate and detachable portion of the report.

(iv) All registrants who make reports in accordance with clause (i) of this subparagraph shall submit the report in writing to the agency.

(D) Reports to individuals of exposures.

(i) Radiation exposure data for an individual shall be reported annually to the individual as specified in this section. The information reported shall include data and results obtained in accordance with agency requirements, orders, certificate of registration conditions, as shown in records maintained by the registrant in accordance with this paragraph. Each notification and report shall:

(I) be in writing;

(II) include appropriate identifying data such as the name of the registrant, the name of the individual, and the individual's identification number;

(III) include the individual's exposure information; and

Give individuals who wear badges (personnel monitoring devices) a written report of their exposures annually.

§289.233(j)(3)(D)(i)(IV)

(IV) contain the following statement:

"This report is furnished to you under the provisions of the Texas Regulations for Control of Radiation, 25 Texas Administrative Code §289.233. You should preserve this report for further reference."

(ii) Each registrant shall advise each worker annually of the worker's dose as shown in records maintained by the registrant in accordance with paragraph (1)(P) of this subsection.

(iii) At the written request of a worker formerly engaged in activities controlled by the registrant, each registrant shall furnish a written report of the worker's exposure to radiation machines. The report shall include the dose record for each year the worker was required to be monitored in accordance with subsection (i)(3)(B) of this section. Such report shall be furnished within 30 days from the date of the request, or within 30 days after the dose of the individual has been determined by the registrant, whichever is later. The report shall cover the period of time that the worker's activities involved exposure to radiation machines and the dates and locations of work under the certificate of registration in which the worker participated during this period.

(iv) When a registrant is required, in accordance with subparagraphs (B) and (C) of this paragraph, to report to the agency any exposure of an individual to radiation machines, the registrant shall also provide the individual a written report of that individual's exposure data included therein. Such reports shall be transmitted at a time not later than the transmittal to the agency.

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§289.233(j)(3)(D)(v)

(v) At the written request of a worker who is terminating employment with the registrant in work involving exposure to radiation machines during the current year, each registrant shall provide at termination to each such worker, or to the worker's designee, a written report regarding the radiation dose received by that worker from operations of the registrant during the current year or fraction thereof. If the most recent individual monitoring results are not available at that time, a written estimate of the dose shall be provided together with a clear indication that this is an estimate. When the final individual monitoring results are available, those written results shall be provided to the worker or the worker's designee.

(vi) When a registrant is required in accordance with paragraph (3)(C) of this subsection to report to the agency any exposure of an identified occupationally exposed individual, or an identified member of the public, to radiation, the registrant shall also notify the individual and provide a copy of the report submitted to the agency, to the individual. Such notice shall be transmitted at a time not later than the transmittal to the agency, and shall comply with the provisions of paragraph (3)(D) of this subsection.

(k) Compliance and hearing procedures.

(1) Inspections.

(A) The agency may enter public or private property at reasonable times to determine whether, in a matter under the agency's jurisdiction, there is compliance with the Act, the agency's rules, certificate of registration conditions, and orders issued by the agency.

The agency may conduct an inspection of your office at any reasonable time.

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§289.233(k)(1)(B)

(B) Each registrant shall afford the agency, at all reasonable times, opportunity to inspect machines, activities, facilities, premises, and records in accordance with this section.

(C) Each registrant shall make available to the agency for inspection, upon reasonable notice, records made and maintained in accordance with this chapter.

(D) During an inspection, agency inspectors may consult privately with workers as specified in subparagraphs (J)-(L) of this paragraph. The registrant may accompany agency inspectors during other phases of an inspection.

(E) If, at the time of inspection, an individual has been authorized by the workers to represent them during agency inspections, the registrant shall notify the inspectors of such authorization and shall give the workers' representative an opportunity to accompany the inspectors during the inspection of physical working conditions.

(F) Each worker's representative shall be routinely engaged in work under control of the registrant and shall have received instructions as specified in subsection (i)(3)(K) of this section.

(G) Different representatives of registrants and workers may accompany the inspectors during different phases of an inspection if there is no resulting interference with the conduct of the inspection. However, only one worker's representative at a time may accompany the inspectors.

The inspector may talk with your employees.

§289.233(k)(1)(H)

(H) With the approval of the registrant and the worker's representative, an individual who is not routinely engaged in work under control of the registrant, for example, a consultant to the registrant or to the worker's representative, shall be afforded the opportunity to accompany agency inspectors during the inspection of physical working conditions.

(I) Notwithstanding the other provisions of this section, agency inspectors are authorized to refuse to permit accompaniment by any individual who deliberately interferes with a fair and orderly inspection. With regard to any area containing proprietary information, the worker's representative for that area shall be an individual previously authorized by the registrant to enter that area.

(J) Agency inspectors may consult privately with workers concerning matters of occupational radiation protection and other matters related to applicable provisions of agency regulations and certificates of registration to the extent the inspectors deem necessary for the conduct of an effective and thorough inspection.

(K) During the course of an inspection any worker may bring privately to the attention of the inspectors, either orally or in writing, any past or present condition which that individual has reason to believe may have contributed to or caused any violation of the Act, the requirements in this chapter, certificate of registration conditions, or any unnecessary exposure of an individual to radiation from any source of radiation under the registrant's control. Any such notice in writing shall comply with the requirements of subparagraph (M) of this paragraph.

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§289.233(k)(1)(L)

(L) The provisions of subparagraph (K) of this paragraph shall not be interpreted as authorization to disregard instructions in accordance with subsection (i)(3)(K) of this section.

(M) Any worker or representative of workers who believes that a violation of the Act, the requirements of this chapter, or certificate of registration conditions exists or has occurred in work under a certificate of registration with regard to radiological working conditions in which the worker is engaged, may request an inspection by giving notice of the alleged violation to the agency. Any such notice shall be in writing, shall set forth the specific grounds for the notice, and shall be signed by the worker or representative of the workers. A copy shall be provided to the registrant by the agency no later than at the time of inspection except that, upon the request of the worker giving such notice, the worker's name and the name(s) of individual(s) referred to therein shall not appear in such copy or on any record published, released, or made available by the agency, except for good cause shown.

(N) If, upon receipt of such notice, the agency determines that the request meets the requirements set forth in subparagraph (M) of this paragraph, and that there are reasonable grounds to believe that the alleged violation exists or has occurred, an inspection shall be made as soon as practicable to determine if such alleged violation exists or has occurred. Inspections in accordance with this section need not be limited to matters referred to in the request.

(O) No registrant, contractor or subcontractor of a registrant shall discharge or in any manner discriminate against any worker because of the following:

Your employees may request an inspection by the agency if they believe these rules are not being followed.

You may not discriminate against any employee who has requested an inspection.

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§289.233(k)(1)(O)(i)

(i) such worker has filed any request or instituted or caused to be instituted any proceeding under this chapter;

(ii) such worker has testified or is about to testify in any such proceeding; or

(iii) because of the exercise by such worker on behalf of that individual or others of any option afforded by this section.

(P) If the agency determines, with respect to a request under subparagraphs (M)-(O) of this paragraph, that an inspection is not warranted because there are no reasonable grounds to believe that a violation exists or has occurred, the agency shall notify the requestor in writing of such determination. The requestor may obtain review of such determination in accordance with the provisions of the Act and the Government Code, Chapters 2001 and 2002.

(Q) If the agency determines that an inspection is not warranted because the requirements of subparagraph (M) of this paragraph have not been met, the agency shall notify the requestor in writing of such determination. Such determination shall be without prejudice to the filing of a new request meeting the requirements of subparagraph (M) of this paragraph.

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(R) The routine inspection interval for veterinary facilities is five years. On-site inspections and remote inspections may be alternated. The inspection interval specified is based upon the average number of health-related violations per inspection, as determined from compliance history data. This interval will be reviewed at least every two years, and appropriate adjustments will be made.

(S) For remote inspection of radiation machines for veterinary medicine, each registrant shall:

(i) respond to a request from the agency for a remote inspection;

(ii) complete the remote inspection forms in accordance with the instructions included with the forms; and

(iii) return to the agency the completed remote inspection forms including documentation of the equipment performance evaluation performed in accordance with subsection (i)(5)(N) of this section and an inventory in accordance with subsection (h)(5)(A) and (B) of this section by the deadline indicated on the forms.

(T) Notwithstanding the inspection intervals specified in this section, the agency may inspect registrants more frequently due to:

(i) the persistence or severity of violations found during an inspection;

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The routine inspection interval for your facility is 5 years.

The agency will perform an inspection every 5 years. An inspector will perform an initial on-site inspection at your facility. The next inspection may be a remote inspection. For a remote inspection, you must complete a form that will be sent to you by the agency. You must return it and your equipment performance evaluation record to the agency. Inspections may alternate between on-site and remote.

The agency may inspect more often for these reasons:

- **severe violations of these rules**
- **investigation of incidents or complaints**
- **a request by your employees**
- **a request by you**

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(ii) investigation of an incident or complaint concerning the facility;

(iii) a request for an inspection by a worker(s) in accordance with subparagraphs (M)-(O) of this paragraph;

(iv) any change in a facility or equipment that might cause a significant increase in radiation output or hazard; or

(v) a mutual agreement between the agency and registrant.

(U) The agency will conduct inspections of veterinary radiation machines in a manner designed to cause as little disruption of a veterinary practice as is practicable.

(V) Each registrant shall perform, upon instructions from the agency, or shall permit the agency to perform such reasonable surveys as the agency deems appropriate or necessary including, but not limited to, surveys of:

(i) radiation machines;

(ii) facilities where radiation machines are used or stored;

(iii) radiation detection and monitoring instruments; and

The agency will try not to disrupt your practice while performing an on-site inspection.

§289.233(k)(1)(V)(iv)

(iv) other equipment and devices used in connection with utilization or storage of radiation machines.

(W) A person who performs on-site inspections of veterinary radiation machines will have training in the design and use of the machines and will receive the following training.

(i) Objectives. Training of agency inspectors of radiation machines will be conducted by the agency. Upon completion of training, the inspector will be able to:

(I) select and operate the necessary testing equipment used to perform an inspection of radiation machines;

(II) utilize radiation protection principles;

(III) operate radiation detection instruments;

(IV) define basic regulatory terminology;

(V) apply this section regarding radiation machines;

(VI) perform routine agency inspections of radiation machines;

Agency inspectors who inspect your facility will be trained in the design and use of x-ray machines.

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(VII) complete agency inspection documentation;

(VIII) demonstrate knowledge of agency ethics, professional, and technical policies; and

(IX) successfully achieve the objectives in this subparagraph.

(ii) Initial training program.

(I) Initial training will be conducted during a six-month period.

(II) All training evaluation instruments will be developed by the agency.

(III) Instruments to be used in determining a proficiency level are as follows:

(-a-) evaluation of each inspector's training needs prior to initial training;

(-b-) evaluation of knowledge obtained and verification of tasks performed by each inspector subsequent to training received by the agency; and

(-c-) evaluation of each inspector's task performance by the agency.

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(iii) Continuing education.

(I) The agency inspector of radiation machines will accumulate 24 hours of continuing education regarding radiation machines, at intervals not to exceed 24 months. These hours of continuing education may be acquired as follows:

(-a-) documented continuing education earned in an agency-accepted training format; and

(-b-) agency staff meetings.

(II) Failure to obtain 24 hours of continuing education within each 24 month interval may result in a reassessment by the agency of an agency inspector's proficiency level.

(III) After the initial training period, each inspector of radiation machines will be evaluated by the agency, at intervals not to exceed 12 months.

(iv) Agency proficiency standards. The agency proficiency standards for agency inspectors of veterinary radiation machines are as follows.

(I) Level I. The agency inspector has not successfully achieved the objectives in clause (i) of this subparagraph after the initial training period. Additional training is required. Unsupervised inspections will not be performed.

§289.233(k)(1)(W)(iv)(II)

(II) Level II. The agency inspector has partially achieved the objectives in clause (i) of this subparagraph, but has not achieved the objective in clause (i)(IX) of this subparagraph after the initial training period. Additional training is required. Unsupervised inspections are not permitted for the type of veterinary radiation machines for which the objectives of clause (i)(IX) of this subparagraph have not been achieved. Unsupervised inspections may be performed for the type of veterinary radiation machines for which the objectives in clause (i)(IX) of this subparagraph have been successfully achieved.

(III) Level III. The agency inspector has successfully achieved the objectives in clause (i) of this subparagraph. Supervision is not required for routine inspections.

(2) Hearing and enforcement procedures.

(A) Violations. A court injunction or agency order may be issued prohibiting any violation of any provision of the Act or any rule or order issued thereunder. Any person who willfully violates any provision of the Act or any rule or order issued thereunder may be subject to civil and/or administrative penalties. Such person may also be guilty of a misdemeanor and upon conviction, may be punished by fine or imprisonment or both, as provided by law.

(B) Denial of an application for a certificate of registration.

The agency may issue injunctions or orders.

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§289.233(k)(2)(B)(i)

(i) When the agency contemplates denial of an application for a certificate of registration, the registrant shall be afforded the opportunity for a hearing. Notice of the denial shall be delivered by personal service or certified mail, addressed to the last known address, to the registrant.

(ii) Any applicant or registrant against whom the agency contemplates an action described in clause (i) of this subparagraph may request a hearing by submitting a written request to the director within 30 days of service of the notice.

(I) The written request for a hearing must contain the following:

(-a-) statement requesting a hearing; and

(-b-) name and address of the applicant or registrant;

(II) Failure to submit a written request for a hearing within 30 days will render the agency action final.

(C) Compliance procedures for registrants and other persons.

(i) A registrant or other person who commits a violation(s) will be issued a notice of violation. The person receiving the notice shall provide the agency with a written statement and supporting documentation by the date stated in the notice describing the following:

The agency may deny your application for registration. You may request a hearing before it's denied.

When violations are found at your facility, you will be sent a notice of violation by the agency.

(I) steps taken by the person and the results achieved;

(II) corrective steps to be taken to prevent recurrence; and

(III) the date when full compliance was or is expected to be achieved. The agency may require responses to notices of violation to be under oath.

(ii) The terms and conditions of all certificates of registration shall be subject to amendment or modification. A certificate of registration may be modified, suspended, or revoked by reason of amendments to the Act, or for violation of the Act, the requirements of this chapter, a condition of the certificate of registration, or an order of the agency.

(iii) Any certificate of registration may be modified, suspended, or revoked in whole or in part, for any of the following:

(I) any material false statement in the application or any statement of fact required in accordance with provisions of the Act;

(II) conditions revealed by such application or statement of fact or any report, record, or inspection, or other means that would warrant the agency to refuse to grant a certificate of registration on an original application;

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Your certificate of registration may be suspended or revoked for these reasons:

- **giving the agency false information**
- **violation of the rules**

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§289.233(k)(2)(C)(iii)(III)

(III) violation of, or failure to observe applicable terms and conditions of the Act, this chapter, or of the certificate of registration or order of the agency; or

(IV) existing conditions that constitute a substantial threat to the public health or safety or the environment.

(iv) If another state or federal entity takes an action such as modification, revocation, or suspension of the certificate of registration, the agency may take a similar action against the registrant.

(v) When the agency determines that the action provided for in clause (viii) of this subparagraph or subparagraph (D) of this paragraph is not to be taken immediately, the agency may offer the registrant an opportunity to attend an **informal meeting** to discuss the following with the agency:

(I) methods and schedules for correcting the violation(s); or

(II) methods and schedules for showing compliance with applicable provisions of the Act, the requirements of this chapter, certificate of registration conditions, or any orders of the agency.

Before suspending or revoking your registration, the agency may offer you the chance to attend an enforcement conference.

§289.233(k)(2)(C)(vi)

(vi) Notice of any **informal meeting** shall be delivered by personal service, or certified mail, addressed to the last known address. An **informal meeting** is not a prerequisite for the action to be taken **in accordance with** clause (viii) of this subparagraph or subparagraph (D) of this paragraph.

(vii) Except in cases in which the occupational and public health, or safety requires otherwise, no certificate of registration shall be suspended or revoked unless, prior to the institution of proceedings therefore, facts or conduct that may warrant such action shall have been called to the attention of the registrant in writing, and the registrant shall have been **afforded** an opportunity to demonstrate compliance with all lawful requirements.

(viii) When the agency contemplates modification, suspension, or revocation of the certificate of registration, the registrant shall be afforded the opportunity for a hearing. Notice of the contemplated action, along with a complaint, shall be given to the registrant by personal service or certified mail, addressed to the last known address.

(ix) Any applicant or registrant against whom the agency contemplates an action described in clause (viii) of this subparagraph may request a hearing by submitting a written request to the director within 30 days of service of the notice.

(I) The written request for a hearing must contain the following:

You have the right to a hearing if the agency considers suspending or revoking your registration.

(-a-) statement requesting a hearing;

(-b-) name, address, and identification number of the registrant against whom the action is being taken.

(II) Failure to submit a written request for a hearing within 30 days will render the agency action final.

(D) Assessment of administrative penalties.

(i) When the agency determines that monetary penalties are appropriate, proposals for assessment of and hearings on administrative penalties shall be made in accordance with the Act, Health and Safety Code, §401.384, Title 1, TAC, Chapter 155, and applicable sections of Formal Hearing Procedures, §§1.21, 1.23, 1.25, and 1.27 of this title.

(ii) Assessment of administrative penalties shall be based on the following criteria:

(I) the seriousness of the violation(s);

(II) previous compliance history;

(III) the amount necessary to deter future violations;

The agency can assess monetary penalties for violations of these rules.

§289.233(k)(2)(D)(ii)(IV)

and

(IV) efforts to correct the violation;

factors.

(V) any other mitigating or enhancing

(iii) Application of administrative penalties.

The agency may impose differing levels of penalties for different severity level violations and different classes of users as follows.

(I) Administrative penalties may be imposed for severity level I and II violations. Administrative penalties may be imposed for severity level III, IV, and V violations when they are combined with those of higher severity level(s) or for repeated violations.

(II) The following Tables IIA and IIB show the base administrative penalties.

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TABLE II
BASE ADMINISTRATIVE PENALTIES

Table IIA – Base Amounts

Type of User	Amount
All registrants	\$5,000
Other persons not registered	\$10,000

Table IIB – Percentage of Base Amounts Based on Severity Level of Violation

Severity Level	Percent of Amount Listed in Table IIA
I	100
II	80
III	50
IV	15
V	5

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(III) Adjustments to the percentages of base amounts in Table IIB may be made for the presence or absence of the following factors:

- (-a-) prompt identification and reporting;
- (-b-) corrective action to prevent recurrence;
- (-c-) compliance history;
- (-d-) prior notice of similar event;
- (-e-) multiple occurrences; and
- (-f-) negligence that resulted in or increased adverse effects.

(IV) The penalty for each violation may be in an amount not to exceed \$10,000 a day for a person who violates the Act or requirements of this chapter, order, certificate of registration issued in accordance with the Act. Each day a violation continues may be considered a separate violation for purposes of penalty assessment.

(iv) The agency may conduct settlement negotiations.

§289.233(k)(2)(E)

(E) Severity levels of violations for registrants or other persons.

(i) Violations for registrants or other persons shall be categorized by one of the following severity levels.

(I) Severity level I are violations that are most significant and may have a significant negative impact on occupational and/or public health and safety or on the environment.

(II) Severity level II are violations that are very significant and may have a negative impact on occupational and/or public health and safety or on the environment.

(III) Severity level III are violations that are significant and which, if not corrected, could threaten occupational and/or public health and safety or the environment.

(IV) Severity level IV are violations that are of more than minor significance, but if left uncorrected, could lead to more serious circumstances.

(V) Severity level V are violations that are of minor safety or environmental significance.

(ii) Criteria to elevate or reduce severity levels.

(I) **Severity levels** may be elevated to a higher severity level for the following reasons:

Agency violations are divided into levels based on the severity of their impact on health and safety.

§289.233(k)(2)(E)(ii)(I)(-a-)

(-a-) more than one violation resulted from the same underlying cause;

(-b-) a violation contributed to or was the consequence of the underlying cause, such as a management breakdown or breakdown in the control of licensed or registered activities;

(-c-) a violation occurred multiple times between inspections;

(-d-) a violation was willful or grossly negligent;

(-e-) compliance history; or

(-f-) other mitigating factors.

(II) Severity levels may be reduced to a lower level for the following reasons:

(-a-) the registrant identified and corrected the violation prior to the agency inspection;

(-b-) the registrant's actions corrected the violation and prevented recurrence; or

(-c-) other mitigating factors.

(iii) Examples of severity levels. Examples of severity levels are available upon request to the agency.

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§289.233(k)(2)(F)

(F) Impoundment of radiation machines. Radiation machines shall be subject to impounding in accordance with the Act, Health and Safety Code, §401.068, and this paragraph.

(i) In the event of an emergency, the agency shall have the authority to impound or order the impounding of radiation machines possessed by any person not equipped to observe or failing to observe the provisions of the Act, Health and Safety Code, Chapter 401, or any rules, certificate of registration conditions, or orders issued by the agency. The agency shall submit notice of the action to be published in the Texas Register no later than 30 days following the end of the month in which the action was taken.

(ii) At the agency's discretion, the impounded radiation machines may be disposed of by:

(I) returning the source of radiation to a properly registered owner, upon proof of ownership, who did not cause the emergency;

(II) releasing the source of radiation as evidence to police or courts;

(III) returning the source of radiation to a registrant after the emergency is over and settlement of any compliance action; or

(IV) sale, destruction or other disposition within the agency's discretion.

The agency may impound your x-ray machine for violation of these rules.

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§289.233(k)(2)(F)(iii)

(iii) If agency action is necessary to protect the public health and safety, no prior notice need be given the owner or possessor. If agency action is not necessary to protect the public health and safety, the agency will give written notice to the owner and/or the possessor of the radiation machine of the intention to dispose of the radiation machine. Notice shall be the same as provided in subparagraph (C)(viii) of this paragraph. The owner or possessor shall have 30 days from the date of personal service or mailing to request a hearing under Title 1, TAC, Chapter 155, and the Formal Hearing Procedures, §§1.21, 1.23, 1.25, and 1.27 of this title, and in accordance with subparagraph (C)(ix) of this paragraph, concerning the intention of the agency. If no hearing is requested within that period of time, the agency may take the contemplated action, and such action is final.

(iv) Upon agency disposition of a radiation machine, the agency may notify the owner and/or possessor of any expense the agency may have incurred during the impoundment and/or disposition and request reimbursement. If the amount is not paid within 60 days from the date of notice, the agency may request the Attorney General to file suit against the owner/possessor for the amount requested.

(v) If the agency determines from the facts available to the agency that an impounded radiation machine is abandoned, with no reasonable evidence showing its owner or possessor, the agency may make such disposition of the radiation machine as it sees fit.

(G) Emergency orders.

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The agency may issue an emergency order to stop using your x-ray machine in order to protect public health and safety. You must follow that order immediately.

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§289.233(k)(2)(G)(i)

(i) When an emergency exists requiring immediate action to protect the public health or safety or the environment, the agency may, without notice or hearing, issue an order citing the existence of such emergency and require that certain actions be taken as it shall direct to meet the emergency. The agency shall, no later than 30 days following the end of the month in which the action was taken, submit notice of the action for publication in the Texas Register. The action taken will remain in full force and effect unless and until modified by subsequent action of the agency.

(ii) An emergency order takes effect immediately upon service.

(iii) Any person receiving an emergency order shall comply immediately.

(iv) The person receiving the order shall be afforded the opportunity for a hearing on an emergency order. Notice of the action, along with a complaint, shall be given to the person by personal service or certified mail, addressed to the last known address. A hearing shall be held on an emergency order if the person receiving the order submits a written request to the director within 30 days of the date of the order.

(I) The hearing shall be held not less than 10 days nor more than 20 days after receipt of the written application for hearing.

You have the right to a hearing on an emergency order.

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§289.233(k)(2)(G)(iv)(II)

(II) At the conclusion of the hearing and after the proposal for decision is made as provided in the Texas Administrative Procedure Act, Texas Government Code, Chapter 2001, the commissioner shall take one of the following actions:

- action is warranted;
 - registration;
 - certificate of registration;
 - order; or
 - is appropriate.
- (-a-) determine that no further
 - (-b-) amend the certificate of
 - (-c-) revoke or suspend the
 - (-d-) rescind the emergency
 - (-e-) issue such other order as

(III) The application and hearing shall not delay compliance with the emergency order.

(H) Miscellaneous provisions.

§289.233(k)(2)(H)(i)

(i) Computation of time. A time period established by the requirements of this chapter shall begin on the first day after the event that invokes the time period. When the last day of the period falls on a Saturday, Sunday, or state or federal holiday, the period shall end on the next day that is not a Saturday, Sunday, or state or federal holiday. The time period shall expire at 5:00 p.m. of the last day of the computed period.

(ii) Hearing location. Hearings will be held at the offices of the State Office of Administrative Hearings in Austin unless the ALJ specifies another location.

(iii) Non-party witness and mileage fees.

(I) A witness or deponent who is not a party (or an employee, agent, or representative of a party) and who is subpoenaed or otherwise compelled to attend an agency hearing or a proceeding to give a deposition, or to produce books, records, papers, accounts, documents, or other objects necessary and proper for the purposes of the hearing or proceeding may receive reimbursement for transportation and other costs at rates established by the current Appropriations Act for state employees.

(II) The person requesting the attendance of the witness or deponent must deposit with the agency the funds estimated to accrue in accordance with subclause (I) of this clause when filing a motion for the issuance of a subpoena or a commission to take a deposition.

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(iv) Service. A return of service by the person who performed personal service, postal return receipt, or proof of mailing to the last known address shall be conclusive evidence of service.

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