**44:03:01:10.  General safety provisions to protect persons from radiation exposures.** The licensee shall be responsible for directing the operation of any X ray system under the licensee's administrative control. The licensee or the licensee's agent shall ensure:

 (1)  No X ray system is operated for diagnostic purpose unless the system meets the provisions of this chapter;

 (2)  Any personnel operating the licensee's X ray system is adequately instructed in the safe operating procedures, is competent in the safe use of the equipment commensurate with the size, scope, and nature of the service, and can demonstrate competence in subjects outlined in § 44:03:01:14.02;

 (3)  Procedures and auxiliary equipment produce images of good diagnostic quality with minimum patient radiation exposure;

 (4)  Digital imaging equipment utilized is consistent with the diagnostic objective of the examination;

 (5)  The film screen combinations are the fastest speed consistent with the diagnostic objective of the examination;

 (6)  A technique chart or manual is located in the vicinity of the control panel of each machine that specifies, for all diagnostic examinations performed with that system:

 (a)  The technique factors to be used that are specific to a patient's anatomical part, size, or, if pediatrics, age, except for any system that has only automatic X ray exposure controls;

 (b)  The type of film-screen combination to be used;

 (c)  The type of grid to be used, if any;

 (d)  The source-image receptor distance (SID) to be used, except for dental and all other fixed SID radiographic equipment;

 (e)  The type and placement of patient shielding to be used;

 (f)  The routine views for all procedures done with each machine; and

 (g)  For mammography, an indication of kVp/target/filter combination. For the purpose of this subsection, target means the point at which an X ray is produced;

 (7)  A written operating and safety procedure that includes restrictions for the safe operation of each radiation machine, is available to each operator and that each operator is able to demonstrate familiarity with these procedures;

 (8)  Except for veterinary licensees, a record containing the patient's name, the type of examination, the date the examination was performed, and equipment operator is maintained;

 (9)  Except for patients who cannot be moved out of the room, only the staff, ancillary personnel or other persons required for the medical procedure are in the room during the radiographic exposure;

 (10)  The following licensee's personnel are supplied with appropriate individual monitoring devices and that required personnel are wearing the monitoring devices:

 (a)  Adults likely to receive in one year, a dose in excess of ten percent of the limits in subdivision (15) of this section;

 (b)  Declared pregnant women likely to receive, during the entire pregnancy, a dose in excess of 0.1 rem or one millisievert (mSv);

 (c)  Each individual who enters a high radiation area or very high radiation area; and

 (d)  Minors likely to receive in one year a dose in excess of 0.1 rem or one mSv;

 (11)  Each individual monitoring device is assigned to and worn by only one individual;

 (12)  Personnel who are required to be monitored for occupational doses according to this section wear individual monitoring devices as follows:

 (a)  An individual monitoring device used for monitoring the dose to the whole body must be worn on the trunk of the body or at the unshielded location of the body likely to receive the highest exposure;

 (b)  When a protective apron is worn, the individual monitoring device must be worn on the collar outside of the protective apron;

 (c)  When more than one individual monitoring device is used, the record must identify the location of the monitor on the body and must state whether it was worn outside or under the protective clothing. The effective dose equivalent must be recorded in the reports required by this section; and

 (d)  When a woman declares her pregnancy to the licensee in writing, a dosimeter must be worn at the level of the abdomen and under any lead shielding;

 (13)  A control device accompanies a licensee’s individual personal monitoring devices during shipment and that the device is kept in an area of natural background radiation at the facility between shipments;

 (14)  Maintenance of clear and legible personnel dosimetry records showing the radiation doses of all individuals for whom individual monitoring is required according to this section;

 (15)  Control of the occupational dose to individual adults, except for planned special exposures, to the most limiting of the following annual dose limit:

 (a)  The total effective dose equivalent being equal to five rem or 0.05 sievert (Sv);

 (b)  The sum of the deep dose equivalent, defined as the dose to organs or tissues that will receive an intake of radioactive material, and the committed dose equivalent, defined as the whole body dose from an external source of ionizing radiation, to any individual organ or tissue, other than the lens of the eye, being equal to fifty rem or 0.5 Sv; or

 (c)  The annual limit to the lens of the eye is a lens dose equivalent of fifteen rem or 0.15 Sv; and

 (d)  The annual limit to the skin and the extremities is a shallow dose equivalent of fifty rem or 0.5 Sv;

 (16)  When a woman declares her pregnancy in writing, that the dose equivalent to the woman's embryo or fetus does not exceed, during the entire pregnancy, 0.5 rem or five mSv due to occupational exposure;

 (17)  Doses received in excess of the annual limits, including doses received during accidents, emergencies, and planned special exposures, are subtracted from the limits for planned special exposures that the individual may receive during the current year;

 (18)  The assigned deep dose equivalent and shallow dose equivalent is for the portion of the body receiving the highest exposure;

 (19)  The deep dose equivalent, lens dose equivalent, and shallow dose equivalent are assessed from surveys or other radiation measurements for the purpose of demonstrating compliance with the occupational dose limits if the individual monitoring device is not in the region of highest potential exposure or the results of individual monitoring are unavailable;

 (20)  When a protective apron is worn while working with fluoroscopic equipment and monitoring is conducted as specified in subdivision (10) of this section, the effective dose equivalent for external radiation is determined as follows:

 (a)  When only one individual monitoring device is used, and it is located at the neck or collar outside the protective apron, the reported deep dose equivalent is the effective dose equivalent for external radiation;

 (b)  When only one individual monitoring device is used, and it is located at the neck or collar outside the protective apron, the reported deep dose equivalent value multiplied by 0.3 is the effective dose equivalent for external radiation; or

 (c)  When individual monitoring devices are worn, both under the protective apron at the waist and outside the protective apron at the collar, the effective dose equivalent for external radiation is assigned the value of the sum of the deep dose equivalent reported for the individual monitoring device located at the waist under the protective apron multiplied by 1.5 and the deep dose equivalent reported for the individual monitoring device located at the collar outside the protective apron multiplied by 0.04; and

 (21)  Radiation sources are labeled and caution signs posted to provide a warning to all persons within the exposure area.

 Any alternative method of determining equivalent dose in subdivisions (18), (19), or (20) of this section must be approved by the department.

 **Source:** SL 1975, ch 16, § 1; 6 SDR 93, effective July 1, 1980; 26 SDR 96, effective January 23, 2000; 31 SDR 62, effective November 7, 2004; 50 SDR 41, effective October 11, 2023.

 **General Authority:** SDCL 34-21-4.1, 34-21-15.

 **Law Implemented:** SDCL 34-21-4.1, 34-21-25, 34-21-26.