44:03:01:01. Definitions. Terms defined by SDCL 34-21-2 have the same meaning when used in this chapter. In addition, the terms used in this chapter mean:

(1) "Added filtration," any filtration that is in addition to the inherent filtration;

(2) "Aluminum equivalent," the thickness of type 1100 aluminum alloy affording the same attenuation, under specified conditions, as the material in question;

(3) "Assembler," any person engaged in the business of assembling, replacing, or installing one or more components into an X ray system or subsystem. The term includes the owner of an X ray system or the owner's employee or agent who assembles components into an X ray system that is subsequently used to provide professional or commercial services;

(4) "Automatic exposure control (AEC)," a device that automatically controls one or more technique factors in order to obtain at a preselected location a required quantity of radiation. The term includes devices such as phototimes and ion chambers;

(5) "C-arm X ray system," and X ray system where the image receptor and X ray tube housing assembly are connected by a common mechanical support system in order to maintain a desired spatial relationship and which is designed to allow a change in the projection of the beam through the patient without a change in the position of the patient;

(6) "Certified components," components of X ray systems that are subject to regulations by the Food and Drug Administration under the Radiation Control for Health and Safety Act of 1968, Pub. L. No. 90-602;

(7) "Certified system," any X ray system that has one or more certified components;

(8) Computed tomography" or "CT," the production of a tomogram by the acquisition and computer processing of X ray transmission data;

(9) "Control panel," that part of the X ray control upon which are mounted the switches, knobs, push buttons, and other hardware necessary for manually setting the technique factors;

(10) "Cooling curve," the graphical relationship between heat units stored and cooling time;

(11) "CRT," cathode ray tube in which cathode rays are used to produce an image on a fluorescent screen;

(12) "Dead-man switch," a switch so constructed that a circuit closing contact can be maintained only by continuous pressure on the switch by the operator;

(13) "Department," the Department of Health;

(14) "Diagnostic X ray system," an X ray system designed for irradiation of any part of the human or animal body for the purpose of diagnosis or visualization;

(15) "Diagnostic X ray imaging system," an assemblage of components for the generation, emission, and reception of X ray and the transformation, storage, and visual display of the resultant X ray image;

(16) "Dose," a quantity of radiation exposure to the whole anatomy or any portion of the human or animal body;

(17) "Exposure survey," an evaluation of the radiation hazards incident to the production, use, release, disposal, or presence of radiation. When appropriate, such an evaluation includes a physical survey of materials and equipment and measurements of levels of radiation or concentration of radioactive material present;

(18) "Fluoroscopy imaging assembly," a subsystem in which X ray photons produce a visible image. The term includes the image receptor such as the image intensifier, spot-film device, electrical interlocks, if any, and structural material providing linkage between the image receptor and diagnostic source assembly;

(19) "Gonad shield," a protective barrier for the testes or ovaries;

(20) Half-value layer," the thickness of specified material that attenuates the beam of radiation to an extent such that the exposure rate is reduced by one-half. For the purpose of this definition, the contribution of all scattered radiation, other than any which might be present initially in the beam concerned, is deemed to be excluded;

(21) "Health arts," those professional disciplines authorized by the laws of South Dakota (SDCL chapter 36-2) to use X ray or radioactive material in the diagnosis or treatment of human or animal disease;

(22) "Heat unit," a unit of energy equal to the product of the peak kilovoltage, milliamps, and seconds, i.e. kVp x mA x second;

(23) "Image intensifier," a device, installed in its housing, that instantaneously converts an X ray pattern into a corresponding light image of higher intensity;

(24) "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;

(25) "Inherent filtration," the filtration of the useful beam provided by the permanently installed components of the tube housing assembly;

(26) "kVp," the maximum value in kilovolts of the potential difference of an X ray generator;

(27) "Lead equivalent," the thickness of lead affording the same attenuation as the material in question;

(28) "Leakage radiation," any radiation coming from within the source housing except for the useful beam and radiation produced when the exposure switch or timer is not activated;

(29) "Licensed practitioner of the healing arts," health professionals for diagnostic or healing treatment of human and animal maladies licensed by the state of South Dakota (SDCL chapter 36-2) for the lawful practice of medicine;

(30) "Light field," that area of the intersection of the light beam from the beam-limiting device and 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 illumination is one-fourth of the maximum in the intersection;

(31) "mA," milliampere;

(32) "mAs," milliampere second;

(33) "Patient," an individual or animal subjected to healing arts examination, diagnosis, or treatment;

(34) "Peak tube potential," the maximum value of the potential difference across the X ray tube during an exposure;

(35) "Personnel monitoring," the use of film badges, pocket chambers, or other devices worn or carried on individuals for the monitoring of personnel exposures to radiation;

(36) "Positive beam limitation," the automatic or semi-automatic adjustment of an X ray beam to the size of the selected image receptor, whereby exposures cannot be made without such adjustment;

(37) "Protective apron," an apron made of radiation absorbing materials used to reduce radiation exposure;

(38) "Protective glove," a glove made of radiation absorbing material used to reduce radiation exposure;

(39) "Qualified expert," an individual who possess the knowledge, training, and experience to measure ionizing radiation, to evaluate safety techniques, and to advise regarding radiation protection needs including health physicists;

(40) "Qualified instructor," an individual who possess the knowledge, training, and experience in the field of radiation to teach fundamentals of radiation safety, equipment operation, film processing, emergency procedures, personnel dosimetry, anatomy and physiology, and radiographic positioning;

(41) "Rad," the special unit of absorbed dose. One rad is equal to an absorbed dose of 100 erg per gram or 0.01 joule per kilogram;

(42) "Radiation hazard," a condition under which a person might receive radiation in excess of the maximum permissible dose;

(43) "Rem," the special unit of any of the quantities expressed as dose equivalent. The dose equivalent in rem is equal to the absorbed dose in rad;

(44) "Scattered radiation," radiation that, during passage through matter, has been deviated in direction;

(45) "Services," may include calibration of radiation-producing machines or instruments, radiation protection surveys, shielding design, radiological health consultations, and personnel dosimetry;

(46) "Shielding," a protective barrier used to reduce radiation exposure to the required degree. For the purpose of this term, a primary protective barrier is the material, excluding filters, placed in the useful beam and a secondary protective barrier is the material that attenuates stray radiation;

(47) "Source-image receptor distance" or "SID," the distance from the source to the center of the input surface of the image receptor;

(48) "Spot film," a radiograph that is made during a fluoroscopic examination to permanently record conditions that exist during that fluoroscopic procedure;

(49) "Spot-film device," a device intended to transport or position, or both, a radiographic image receptor between the X ray source and fluoroscopic image receptor. The term includes a device intended to hold a cassette over the input end of an image intensifier for the purpose of making a radiograph;

(50) "Stray radiation," the sum of leakage and scattered radiation;

(51) "Target," the point at which an X ray is produced;

(52) "Technique factors," the following conditions of operation:

(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 X ray systems designed for pulsed operation, 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 X ray systems 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 and the scan time if the scan time and exposure time are equivalent; and

(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;

(53) "Tube," an X ray tube;

(54) "Variable-aperture beam-limiting device," a beam-limiting device that has capacity for stepless adjustment of the X ray field size at a given SID;

(55) "X ray exposure control," a device, switch, button, or other similar by which an operator initiates or terminates, or both, the radiation exposure. The term may include such associated equipment as timers and back-up timers;

(56) "X ray equipment," an X ray system, subsystem, or component of the system;

(57) "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;

(58) "X ray system," an assemblage of components for the controlled production of X rays. The term 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. Any additional component, which functions with the system, is considered an integral part of the system; and

(59) "X ray tube," any electron tube which is designed for the conversion of electrical energy into X ray energy.

Source: SL 1975, ch 16, § 1; 6 SDR 93, effective July 1, 1980; 26 SDR 96, effective January 23, 2000.

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

Law Implemented: SDCL 34-21-11, 34-21-18.