REGULATIONS
AND
STATUTES
Kansas Radiation Control Program

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Kansas Annotated Regulations
Part 1. Definitions

28-25-133. Persons protected. These regulations state the requirements that shall be applied in the use of all radiation, radiation machines, and radioactive materials to ensure the maximum protection of the public health and the maximum safety to all persons at, or in the vicinity of, the place of use, storage, or disposal of sources of radiation. These regulations are intended to be consistent with the best use of radiation machines and radioactive materials, and to encourage the constructive uses of radiation. (Authorized by and implementing K.S.A. 1984 Supp. 48-1607; effective Jan. 1, 1970; amended May 1, 1976; amended, T-85-43, Dec. 19, 1984; amended May 1, 1985.)

28-35-134. Persons regulated and exempted. Except as otherwise specified, these regulations shall apply to all persons who receive, possess, use, transfer, own or acquire any source of radiation. However, nothing in these regulations shall apply to any person to the extent that the person is subject to regulation by the United States nuclear regulatory commission. Regulation by the secretary of source material, by-product material, and special nuclear material in quantities not sufficient to form a critical mass is subject to the provisions of the agreement between the department and the U.S. nuclear regulatory commission and to part 150 of the commission's regulations (10 CFR Part 150), as in effect on January 29, 1982. The provisions of part 4 of these regulations shall not limit the exposure of patients to radiation for the purpose of diagnosis or therapy, by persons licensed to practice one or more of the healing arts within the authority granted to them by the Kansas healing arts statutes, or by persons licensed to practice dentistry or podiatry within the authority granted to them by Kansas licensing laws applying to dentists and podiatrists. (Authorized by and implementing K.S.A. 1984 Supp. 48-1607; effective Jan. 1, 1970; amended May 1, 1976; amended, T-85-43, Dec. 19, 1984; amended May 1, 1985.)


28-35-135a. Definitions. As used in these regulations, each of the following terms shall have the meaning specified in this regulation: (a) "A₁" means the maximum activity of special form radioactive material permitted in a type A package.

(b) "A₂" means the maximum activity of radioactive material, other than special form radioactive material, permitted in a type A package. These values are listed in or may be derived as specified in 10 C.F.R. part 71, appendix A, which is adopted by reference in K.A.R. 28-35-221b [p.224].

(c) "Absorbed dose" means the energy imparted to matter by ionizing radiation per unit mass of irradiated material at the place of interest. The units of absorbed dose are the rad and the gray (Gy).

(d) "Absorbed dose rate" means the absorbed dose per unit of time or, for linear accelerators, the dose monitor unit per unit of time.

(e) "Accelerator-produced material" means any material made radioactive by exposing it in a particle accelerator.

(f) "Accessible surface" means the surface of equipment or of an equipment part that can be easily or accidentally touched by persons without the use of a tool.

(g) "Accident" means an unintended event, including an operating error, equipment failure, and other mishap, that could result in either of the following:

(1) A dose in excess of regulatory limits on site or for the public; or

(2) consequences or potential consequences that cannot be ignored from the point of view of protection or safety, including an actual or potential substantial degradation of the level of protection or safety of the facility or the release of radioactive material in sufficient quantity to warrant consideration of protective actions.

(h) "Act" means the "nuclear energy development and radiation control act," K.S.A. 48-1601 et seq., and amendments thereto.

(i) "Activity" means the rate of disintegration, transformation, or decay of radioactive material. Activity is
expressed in the SI unit of becquerel (Bq) or in the special unit of curie (Ci), or the multiples of either unit.

(j) "Added filter" means the filter added to the inherent filtration.

(k) "Address of use" means the building or buildings that are identified on the license and each location where radioactive material could be produced, prepared, received, used, or stored.

(l) "Adult" means an individual who is 18 or more years of age.

(m) (1)"Agreement state" means any state with which the nuclear regulatory commission (NRC) enters, or has entered, into an effective agreement pursuant to subsection 274b of the atomic energy act of 1954, 68 Stat. 919, as amended.

(2) "Non-agreement state" means any other state.

(n) "Airborne radioactive area" means the following:

(1) Any room, enclosure, or operating area in which airborne radioactive material exists in concentrations in excess of the derived air concentrations (DAC) specified in "appendices to part 4: standards for protection against radiation," effective April 1994, published by the department and hereby adopted by reference; or

(2) any room, enclosure, or operating area in which airborne radioactive material exists in concentrations such that an individual present in the area without respiratory protective equipment could exceed, during the hours an individual is present in a week, an intake of 0.6 percent of the ALI or 12 DAC-hours.

(o) "Airborne radioactive material" means any radioactive material dispersed in the air in the form of dust, fumes, mists, vapors, or gases.

(p) "Air kerma" means the kinetic energy released in air by ionizing radiation. Kerma is determined by dividing dE by dM, where dE is the sum of the initial kinetic energies of all the charged ionizing particles liberated by uncharged ionizing particles in air of mass dM. The SI unit of air kerma is joule per kilogram, and the special name for the unit of kerma is the gray (Gy).

(q) "Alert" means a period during which one of the following could lead to a release of radioactive material that is not expected to require a response by off-site response organizations to protect persons off-site:

(1) Conditions have arisen that could cause an event.

(2) An event is in progress.
(3) An event has occurred.

(r) "Aluminum equivalent" means the thickness of type 1100 aluminum alloy that affords the same attenuation, under specified conditions, as that of the material in question. The nominal chemical composition of type 1100 aluminum alloy is a minimum of 99.00 percent aluminum and 0.12 percent copper.

(s) "Amendment" means any change to a license or registration issued under these regulations.

(t) "Analytical X-ray system" means a group of local and remote components utilizing X-rays to determine the elemental composition or to examine the microstructure of materials.

(1) Local components shall include those components that are struck by X-rays, including radiation source housings, port and shutter assemblies, collimators, sample holders, cameras, goniometers, detectors, and shielding.

(2) Remote components may include power supplies, transformers, amplifiers, readout devices, and control panels.

(u) "Annual limit on intake" and "ALI" mean the derived limit for the amount of radioactive material taken into the body of an adult worker by inhalation or ingestion in a year. ALI is the smaller value of intake of a given radionuclide in a year by the reference man that would result in a committed effective dose equivalent of 5 rem (0.05 Sv) or a committed dose equivalent of 50 rem (0.5 Sv) to any individual organ or tissue. ALI values for intake by ingestion and by inhalation of selected radionuclides are specified in appendix B, table I, published in "appendices to part 4: standards for protection against radiation," which is adopted by reference in this regulation.

(v) "Annual refresher safety training" means a review conducted or provided by the licensee or registrant for its employees on radiation safety aspects of industrial radiography. The review shall include, at a minimum, any results of internal inspections, new procedures or equipment, new or revised regulations, and accidents or errors that have been observed. The review shall also provide opportunities for employees to ask safety questions.

(w) "ANSI" means the American national standards institute.

(x) "Applicator" means a structure that determines the extent of the treatment field at a given distance from the virtual source.
"Area of use" means a portion of a physical structure that has been set aside for the purpose of producing, preparing, receiving, using, or storing radioactive material.

"As low as is reasonably achievable" and "ALARA," when used to describe exposures to radiation workers, mean that every reasonable effort has been made to maintain exposures to radiation workers as far below the dose limits specified in these regulations as is practical, consistent with the purpose for which the licensed or registered activity is undertaken, taking the following into account:

1. The state of technology;
2. The economics of improvements in relation to the state of technology;
3. The economics of improvements in relation to benefits to public health and safety and to other societal and socioeconomic considerations; and
4. The economics of improvements in relation to the utilization of nuclear energy and licensed or registered sources of radiation in the public interest.

"Assembler" means any person engaged in the business of assembling, replacing, or installing one or more components into an X-ray system or subsystem. The term shall include the owner of an X-ray system or any employee or agent of the owner who assembles components into an X-ray system that is subsequently used to provide professional or commercial services.

"Associated equipment" means equipment that is used in conjunction with a radiographic exposure device that makes radiographic exposures and that drives, guides, or comes in contact with the source.

"Attenuation block" means a block or stack, with dimensions of 20 cm by 20 cm by 3.8 cm, made of type 1100 aluminum alloy or other materials having equivalent attenuation.

"Authorized user" means an individual who is identified as an authorized user on a license issued by the department for the use of radioactive material or an individual who is designated by a registered facility as a user of X-ray machines or accelerators. This term shall not apply to part 6 of these regulations.

"Automatic exposure control" means a device that automatically controls one or more technique factors in order to obtain a required quantity of radiation, at one or more preselected

28-35-135b. Definitions. As used in these regulations, each of the following terms shall have the meaning assigned in this regulation: (a) (1) "Background radiation" means the following:
   (A) Radiation from cosmic sources;
   (B) naturally occurring radioactive materials, including radon, except for those radioactive materials that are a decay product of source material or special nuclear material; and
   (C) global fallout as it exists in the environment from the testing of nuclear explosive devices.
   (2) The term "background radiation" shall not include radiation from radioactive materials regulated by the department.
   (b) "Beam axis" means a line from the source through the centers of the X-ray fields.
   (c) "Beam-limiting device" means a device that provides a means to restrict the dimensions of the X-ray field.
   (d) "Beam-monitoring filter" means a filter used to scatter a beam of electrons.
   (e) "Beam-monitoring system" means a system designed to detect and measure the radiation present in the useful beam.
   (f) "Beam-scattering foil" means a thin piece of material, usually metallic, placed in a beam of electrons to scatter the beam in order to provide more uniform electron distribution in the useful beam.
   (g) "Becquerel (Bq)" means the SI unit of activity. One becquerel is equal to one disintegration per second (dps) or transformation per second (tps).
   (h) "Bent-beam linear accelerator" means a linear accelerator in which the accelerated electron beam must change direction by passing through a bending magnet.
   (i) "Bioassay" means the determination of kinds, quantities, or concentrations and, in some cases, the locations of radioactive material in the human body, whether by direct measurement, in vivo counting, or analysis and evaluation of materials excreted or removed from the human body. For purposes of these regulations, "radiobioassay" shall be considered an equivalent term.
(j) "Brachytherapy" means a method of radiation therapy in which sealed sources are utilized to deliver a radiation dose at a distance of up to a few centimeters, by surface, intracavitary, or interstitial application.

(k)(1) "Byproduct material" means the following:
   (A) Any radioactive material, except special nuclear material, yielded in or made radioactive by exposure to the radiation incident to the process of producing or utilizing special nuclear material; and
   (B) the tailings or wastes produced by the extraction or concentration of uranium or thorium from ore processed primarily for its source material content including discrete surface wastes resulting from uranium or thorium solution-extraction processes. Underground ore bodies depleted by these solution-extraction processes shall not constitute "byproduct material" within this definition.

   (2) For the purposes of part 6, "byproduct material" shall mean all radioactive material regulated by the department. (Authorized by K.S.A. 48-1607; implementing K.S.A. 48-1603 and 48-1607; effective Dec. 30, 2005.)

28-35-135c. Definitions. As used in these regulations, each of the following terms shall have the meaning specified in this regulation: (a) "Cabinet radiography using radiation machines" means industrial radiography that is conducted in an enclosed, interlocked cabinet that prevents the radiation machine from operating unless all openings are securely closed and that is sufficiently shielded so that every location on the cabinet's exterior meets the conditions for an unrestricted area as specified in K.A.R. 28-35-214a [p.206].

   (b) "Cabinet X-ray system" means an X-ray system with the X-ray tube installed in an enclosure, called a "cabinet," that is independent from existing architectural structures except the floor on which the cabinet could be placed. The cabinet is intended for the following purposes:
      (1) To contain at least that portion of a material being irradiated;
      (2) to provide radiation attenuation; and
      (3) to exclude personnel from the interior of the cabinet during the generation of X-rays.
This term shall include all X-ray systems designed primarily for the inspection of carry-on baggage at airline, railroad, and bus terminals, and in similar facilities. An X-ray tube that is used within a shielded part of a building, or X-ray equipment that may temporarily or occasionally incorporate portable shielding, shall not be considered a cabinet X-ray system.

(c) "Calendar quarter" means at least 12 but not more than 14 consecutive weeks. The first calendar quarter of each year shall begin in January. Subsequent calendar quarters shall be arranged so that no day is included in more than one calendar quarter and no day in any one year is omitted from inclusion within a calendar quarter. A licensee or registrant shall not change the method of determining and observing calendar quarters for purposes of these regulations except at the beginning of a calendar year.

(d) "Calibration" means the determination of either of the following:

(1) The response or reading of an instrument relative to a series of known radiation values over the range of the instrument; or
(2) the strength of a source of radiation relative to a standard.

(e) "Camera" means a radiographic exposure device.

(f) "Central axis of the beam" means a line passing through the virtual source and the center of the plane figure formed by the edge of the first beam-limiting device.

(g) "Cephalometric device" means a device intended for the radiographic visualization and measurement of the dimensions of the human head.

(h) "Certifiable cabinet X-ray system" means an existing, uncertified X-ray system that has been modified to meet the certification requirements specified in 21 C.F.R. 1020.40, as in effect on April 30, 1984.

(i) "Certified cabinet X-ray system" means a cabinet X-ray system that has been certified as manufactured and assembled as specified in 21 C.F.R. 1020.40, as in effect on April 30, 1984.

(j) "Certified components" means the components of X-ray systems that are subject to regulations promulgated under public law 90-602, the radiation control for health and safety act of 1968 as amended.

(k) "Certified system" means any X-ray system that has one or more certified components.
"Certifying entity" means an independent certifying organization or state regulatory program meeting the requirements in K.A.R. 28-35-293 [p.317].

"Changeable filter" means any filter, exclusive of inherent filtration, that can be removed from the useful beam through any electronic, mechanical, or physical process.

"Chelating agent" means amine polycarboxylic acids, hydroxycarboxylic acids, gluconic acids, and polycarboxylic acids.

"Class" means a classification scheme for inhaled material according to its rate of clearance from the pulmonary region of the lung. For the purposes of these regulations, "lung class" and "inhalation class" shall be considered equivalent terms. Materials are classified as D, W, or Y, which applies to the following range of clearance half-times:

1. For class D, fewer than 10 days;
2. for class W, from 10 through 100 days; and
3. for class Y, more than 100 days.

"Coefficient of variation" and "C" mean the ratio of the standard deviation to the mean value of a population of observations. This ratio 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

"Collective dose" means 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.

"Collimator" means a radiation shield that is placed at the end of a guide tube or directly onto a radiographic exposure device to restrict the size of the radiation beam when the sealed source is cranked into position to make a radiographic exposure.

"Committed dose equivalent" and "HT,50" mean the dose equivalent to organs or tissues of reference (T) that will be received from an intake of radioactive material by an individual during the 50-year period following the intake.
(t) "Committed effective dose equivalent" and "HE,50" mean the sum of the products of the weighting factors applicable to each of the body organs or tissues that are irradiated and the committed dose equivalent to each of these organs or tissues (HE,50 = Sum(σwITHT,50)).

(u) "Computed tomography" means the production of a tomogram by the acquisition and computer processing of X-ray transmission data.

(v) "Consortium" means an association of medical use licensees and a positron emission tomography (PET) radionuclide production facility in the same geographical area that jointly own or share the operation and maintenance cost of the PET radionuclide production facility that produces PET radionuclides for use in producing radioactive drugs within the consortium for noncommercial distributions among its associated members for medical use.

(w) "Contact therapy" means therapy in which the X-ray tube port is put in contact with, or within five centimeters of, the surface being treated.

(x) "Contact therapy system" means a therapeutic radiation machine with a short target-to-skin distance (TSD), usually less than five centimeters.

(y) "Control cable" means the cable that is connected to the source assembly and used to drive the source to and from the exposure location.

(z) "Control drive mechanism" means a device that enables the source assembly to be moved into and out of the exposure device.

(aa) "Controlled area" means an area outside of a restricted area but inside the site boundary, access to which can be limited by the licensee or registrant for any reason.

(bb) "Control panel" means that part of the X-ray system where the switches, knobs, push buttons, and other hardware necessary for manually setting the technique factors are mounted.

(cc) "Control tube" means a protective sheath for guiding the control cable. The control tube connects the control drive mechanism to the radiographic exposure device.

(dd) "Cooling curve" means the graphical relationship between the heat units stored and the cooling time.
"Curie" means a unit of activity. One curie (Ci) is the quantity of radioactive material that decays at the rate of $3.7 \times 10^{10}$ transformations per second (tps). Commonly used submultiples of the curie are the millicurie and the microcurie. One millicurie (mCi) = 0.001 curie = $3.7 \times 10^7$ tps. One microcurie (uCi) = 0.000001 curie = $3.7 \times 10^4$ tps. (Authorized by K.S.A. 48-1607; implementing K.S.A. 2017 Supp. 48-1603 and K.S.A. 48-1607; effective Dec. 30, 2005; amended May 4, 2018.)

28-35-135d. Definitions. As used in these regulations, each of the following terms shall have the meaning assigned in this regulation: (a) "Deadman switch" means a switch constructed so that circuit closure can be maintained only by continuous pressure by the operator.

(b) "Declared pregnant woman" means a woman who has voluntarily informed her employer, in writing, of her pregnancy and the estimated date of delivery. The written declaration shall remain in effect until the declared pregnant woman withdraws the declaration in writing or is no longer pregnant.

(c) "Decommission" means to remove a facility or site safely from service and reduce residual radioactivity to a level that permits either of the following:

(1) The release of the property for unrestricted use and the termination of the license; or
(2) the release of the property under restricted conditions and the termination of the license.

(d) "Dedicated check source" means a radioactive source that is used to ensure the constant operation of a radiation detection or measurement device over several months or years. This source may also be used for other purposes.

(e) "Deep dose equivalent (Hd)," which applies to external whole body exposure, means the dose equivalent to a tissue depth of one centimeter (1,000 mg/cm²).

(f) "Deliberate misconduct" means a person's intentional act or omission about which the person knows one of the following:

(1) If not detected, the act or omission would cause a licensee, a registrant, or an applicant to be in violation of any statute, regulation, or order or any term, condition, or limitation of any license issued by the secretary.
(2) The act or omission constitutes a violation of a requirement, procedure, instruction, contract, purchase order, or policy of a licensee, registrant, applicant, contractor, or subcontractor.

(3) The act or omission involves the person's deliberate submission to the department, a licensee, a registrant, an applicant, or a licensee's contractor or subcontractor of information relating to a licensee's, a registrant's, or an applicant's operations that the person knows to be incomplete or inaccurate in some respect.

(g) "Dentistry" means the functions authorized by K.S.A. 65-1421 et seq., and amendments thereto.

(h) "Department" means the department of health and environment.

(i) "Depleted uranium" means source material uranium in which the isotope uranium 235 is less than 0.711 percent of the total weight of uranium present. This term shall not include special nuclear material.

(j) "Derived air concentration (DAC)" means the concentration of a given radionuclide in air that, if breathed by the reference man for a working year of 2,000 hours under conditions of light work, results in an intake of one ALI. For purposes of these regulations, the condition of light work is an inhalation rate of 1.2 cubic meters of air per hour for 2,000 hours in a year. The DAC are values specified in "appendices to part 4: standards for protection against radiation," effective April 1994, which is adopted by reference in K.A.R. 28-35-135a [p.3].

(k) "Derived air concentration-hour (DAC-hour)" means the product of the concentration of radioactive material in air, expressed as a fraction or multiple of the derived air concentration for each radionuclide, and the time of exposure to that radionuclide, in hours. A licensee or registrant may assume that a total of 2,000 DAC-hours represents one ALI, which is equivalent to a committed effective dose equivalent of 5 rem (0.05 Sv).

(l) "Diagnostic clinical procedures manual" means a collection of written procedures that describes each method and other instructions and precautions by which the licensee performs diagnostic clinical procedures, each of which has been approved by the authorized user and includes the radiopharmaceutical, dosage, and route of administration.
(m) "Diagnostic source assembly" means the tube housing assembly with a beam-limiting device attached.

(n) "Diagnostic-type tube housing" means an X-ray tube housing constructed so that the leakage radiation, at a distance of one meter from the target, does not exceed 100 milliroentgens in one hour when the tube is operated at the maximum rate of continuous tube current and the maximum rate of tube potential.

(o) "Diagnostic X-ray imaging system" means an assemblage of components for the generation, emission, and reception of X-rays and the transformation, storage, and visual display of the resultant X-ray image.

(p) "Diagnostic X-ray system" means an X-ray system designed for irradiation of any part of the human body for the purpose of diagnosis or visualization.

(q) "Direct scattered radiation" means scattered radiation that has been deviated in direction only by materials irradiated by the useful beam.

(r) "Dose" is a generic term that means the absorbed dose, dose equivalent, effective dose equivalent, committed dose equivalent, committed effective dose equivalent, total organ dose equivalent, or total effective dose equivalent. For purposes of these regulations, "radiation dose" shall be considered an equivalent term.

(s) "Dose equivalent (H\text{\textsubscript{T}})" means the product of the absorbed dose in tissue, quality factor, and all other necessary modifying factors at the location of interest. The units of dose equivalent are the rem and sievert (Sv).

(t) "Dose limits" means the permissible upper bounds of radiation doses established in accordance with these regulations. For purposes of these regulations, "limits" is an equivalent term.

(u) "Dose-monitoring system" means a system of devices for the detection, measurement, and display of quantities of radiation.

(v) "Dose monitor unit" means a unit response from the dose-monitoring system from which the absorbed dose can be calculated.

(w) "Dosimetry processor" means an individual or an organization that processes and evaluates individual monitoring devices in order to determine the radiation dose delivered to the monitoring devices.
(x) "Doubly encapsulated sealed source" means a sealed source in which the radioactive material is sealed within an inner capsule and that capsule is sealed within an outer capsule.

(y) "Drill" means a supervised, hands-on instruction period intended to test, develop, or maintain a specific emergency response capability. A drill may be a component of an exercise. (Authorized by K.S.A. 48-1607; implementing K.S.A. 48-1603 and 48-1607; effective Dec. 30, 2005; amended July 27, 2007.)

**28-35-135e. Definitions.** As used in these regulations, each of the following terms shall have the meaning assigned in this regulation: (a) "Effective dose equivalent (HE)" means the sum of the products of the dose equivalent to each organ or tissue (HT) and the weighting factor (wT) applicable to each of the body organs or tissues that are irradiated (HE = Sum(σ) wTHT).

(b) "Embryo or fetus" means the developing human organism at any stage of development until the time of birth.

(c) "Emergency" means an event requiring prompt action to mitigate a threat to the health and safety of workers or the public or a threat of damage to the environment.

(d) "Emergency planning zone" means a geographic area surrounding a specific facility for which special planning and preparedness efforts are carried out to ensure that prompt and effective protective actions will reduce or minimize the impact of releases of radioactive material on public health and safety or the environment.

(e) "Energy compensation source (ECS)" means a small sealed source, with an activity not exceeding 3.7 Mbq (100 microcuries), used within a logging tool or other tool components to provide a reference standard to maintain the tool's calibration when in use.

(f) "Entrance exposure rate" means the roentgens per unit of time at the point where the center of the useful beam enters any individual.

(g) "Entrance or access point" means any opening through which an individual or extremity of an individual could gain access to radiation areas or to licensed or registered radioactive materials. This term shall include entry and exit portals of sufficient size to permit human entry, irrespective of the intended use.
"Evacuation" means the urgent removal of people from an area to avoid or reduce high-level, short-term exposure.

"Event" means a situation reasonably discrete in time, location, and consequences.

"Exercise" means a multifaceted activity that test the plans, procedures, adequacy of training, resources, and integrated capability of an emergency response system.

"Existing equipment" means therapy systems subject to K.A.R. 28-35-250a [p.288] that were manufactured on or before January 1, 1985.

"Explosive material" means any chemical compound, mixture, or device that produces a substantial, instantaneous release of gas and heat spontaneously or by contact with sparks or flame.

"Exposure" means the quotient of $dQ$ divided by $dm$. $dQ$ 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, expressed as $dm$, are completely stopped in air. The special unit of exposure is the roentgen (R). One roentgen equals $2.58 \times 10^{-4}$ coulombs per kilogram of air.

"Exposure head" means a device that locates the sealed source in the selected working position. For the purposes of these regulations, "source stop" is an equivalent term.

"Exposure rate" means the exposure per unit of time, including roentgens per minute (R/min) and milliroentgens per hour (mR/hr).

"External beam radiation therapy" means therapeutic irradiation in which the source of radiation is at a distance from the body.

"External dose" means that portion of the dose equivalent received from any source of radiation outside the body.

"Extremity dose" means the external dose equivalent to the hand, elbow, arm below the elbow, foot, knee, and leg below the knee.

"Eye dose equivalent" means the external dose equivalent to the lens of the eye, at a tissue depth of 0.3 centimeter or 300 mg/cm². (Authorized by K.S.A. 48-1607; implementing K.S.A. 48-1603 and 48-1607; effective Dec. 30, 2005.)
28-35-135f. Definitions. As used in these regulations, each of the following terms shall have the meaning assigned in this regulation: (a) "Facility" means the specific location at which a person is licensed or registered to use radioactive material or radiation-producing devices. Separate physical locations shall be considered to be separate facilities.

(b) "Fail-safe characteristic" means a design feature that causes beam port shutters to close, or otherwise prevents emergence of the primary beam, upon the failure of a safety or warning device.

(c) "Field emission equipment" means equipment that uses an X-ray tube in which electron emission from the cathode is due solely to the action of an electric field.

(d) "Field-flattening filter" means a filter used to provide dose uniformity over the area of a useful beam of X-rays at a specified depth.

(e) "Field size" means the dimensions along the major axes of an area in a plane perpendicular to the specified direction of the beam of incident radiation at the normal treatment distance. Field size is defined by the intersection of the major axes and the 50 percent isodose line. Material shall be placed in the beam so that the maximum dose is produced at the normal treatment distance when the field size is being determined.

(f) "Field station" means a facility where radioactive sources or radiation-processing devices are stored or used and from which equipment is dispatched to temporary job sites.

(g) "Filter" means material placed in the path of the useful beam of X-rays to selectively absorb the less penetrating radiation.

(h) "Fluoroscopic imaging assembly" means a component that comprises a reception system in which X-ray photons produce a fluoroscopic image. This term shall include equipment housings, any electrical interlocks, the primary protective barrier, and structural material providing linkage between the image receptor and the diagnostic source assembly.

(i) "Focal spot" means the area projected on the anode of the X-ray tube by the electrons accelerated from the cathode and from which the useful beam originates.

(j) "Full-cost reimbursement" means reimbursement of the total cost of staff time and any contractual support services

28-35-135g. Definitions. As used in these regulations, each of the following terms shall have the meaning assigned in this regulation: (a) "Gantry" means that part of the system supporting and allowing possible movements of the radiation head.

(b) "General emergency" means that an accident has occurred or is in progress, involving actual or imminent catastrophic reduction of facility safety systems with the potential for loss of containment or confinement integrity or release of radioactive material that can be reasonably expected to exceed off-site protective action guides.

(c) "Generally applicable environmental radiation standards" means standards issued by the U.S. environmental protection agency (EPA) under the authority of the atomic energy act of 1954, as amended, that impose limits on radiation exposures or levels, or concentrations or quantities of radioactive material, in the general environment outside the boundaries of locations under the control of persons possessing or using radioactive material.

(d) "General purpose radiographic X-ray system" means any radiographic X-ray system that, by design, is not limited to the radiographic examination of specific anatomical regions.

(e) "Gonadal shield" means a protective barrier for the testes or ovaries.

(f) "Gray (Gy)" means the SI unit of absorbed dose. One gray is equal to an absorbed dose of one joule per kilogram. One gray is also equal to 100 rads.

(g) "Group I" means prepared radiopharmaceuticals that are used for diagnostic studies involving measurements of uptake, dilution, and excretion, as specified in 10 CFR 35.100, which is adopted by reference in K.A.R. 28-35-264 [p.291].

(h) "Group II" means prepared radiopharmaceuticals that are used for diagnostic studies involving imaging and tumor localizations and any radioactive material in a radiopharmaceutical prepared from a group II kit or providing a single dose. With respect to radiopharmaceuticals prepared from group II kits or as single doses, group II shall refer to the unsealed byproduct material specified in 10 CFR 35.200, which is adopted by reference in K.A.R. 28-35-264 [p.291].
(i) "Group III" means generators and reagent kits that are used following the manufacturer's instructions for the preparation of diagnostic radiopharmaceuticals. With respect to generators and reagent kits, group III shall refer to the unsealed byproduct material specified in 10 CFR 35.200, which is adopted by reference in K.A.R. 28-35-264 [p.291].

(j) "Group IV" means prepared radiopharmaceuticals that are used for certain therapeutic uses that do not normally require hospitalization for purposes of radiation safety. With respect to uses that do not normally require hospitalization, group IV shall refer to the unsealed byproduct material specified in 10 CFR 35.300, which is adopted by reference in K.A.R. 28-35-264 [p.291].

(k) "Group V" means prepared radiopharmaceuticals for certain therapeutic uses that normally require hospitalization for purposes of radiation safety. With respect to uses that normally require hospitalization, group V shall refer to unsealed byproduct material specified in 10 CFR 35.300, which is adopted by reference in K.A.R. 28-35-264 [p.291].

(l) "Group VI" means sources and devices containing radioactive material used for medical diagnosis and therapy, as specified in 10 CFR 35.400, which is adopted by reference in K.A.R. 28-35-264 [p.291].

(m) "Guide tube" means a flexible or rigid tube for guiding the source assembly and the attached control cable from the exposure device to the exposure head. This term may include the connections necessary for attachment to the exposure device and to the exposure head. (Authorized by K.S.A. 48-1607; implementing K.S.A. 48-1603 and 48-1607; effective Dec. 30, 2005.)

28-35-135h. Definitions. As used in these regulations, each of the following terms shall have the meaning assigned in this regulation: (a) "Half-life" means the time required for the activity of any given radioisotope to decay to one-half of its original activity.

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

(c) "Hands-on experience," as applied to industrial radiology, means experience in all areas considered to be directly involved in the radiography process. This term shall include taking
radiographs, the calibration of survey instruments, operational and performance testing of survey instruments and devices, film development, the posting of radiation areas, transporting radiography equipment, the posting of records and radiation area surveillance, and other areas as applicable. A disproportionate amount of time spent in only one or two of these areas shall not be counted toward the 2,000 hours of hands-on experience required for a radiation safety officer or a radiographer.

(d) "Hazardous waste" shall have the meaning assigned in K.A.R. 28-31-3.

(e) "Healing arts" means the activities authorized in K.S.A. 65-2801 et seq., and amendments thereto.

(f) "Healing arts screening" means the testing of human beings using X-ray machines for the detection or evaluation of health indications when the test is performed without any prior examination and without any specific and individual order by a licensed practitioner of the healing arts who is legally authorized to perform examinations and to prescribe X-ray tests for the purpose of diagnosis or treatment.

(g) "Heat unit" means a unit of energy equal to the product of the peak kilovoltage, milliamperes, and seconds (kVp x mA x second).

(h) "High dose-rate remote afterloader" means a brachytherapy device that remotely delivers a dose rate in excess of 12 grays (1,200 rads) per hour at the point or surface where the dose is prescribed.

(i) "High-radiation area" means any area that is accessible to individuals, in which there exists radiation at such levels that a major portion of the body could receive, in any one hour and at 30 centimeters from the source of the radiation or any surface that the radiation penetrates, a dose to the whole body in excess of 100 millirems. For purposes of these regulations, rooms or areas in which diagnostic X-ray systems are used for healing arts purposes shall not be considered high-radiation areas.

(j) "Human use" means the intentional internal or external administration of radiation or radioactive material to any individual. (Authorized by K.S.A. 48-1607; implementing K.S.A. 48-1603 and 48-1607; effective Dec. 30, 2005.)
28-35-135i. Definitions. As used in these regulations, each of the following terms shall have the meaning specified in this regulation: (a) "Image intensifier" means a device that instantaneously converts, by means of photoemissive surfaces and electronic circuitry, an X-ray pattern into a light pattern of greater intensity than would have been provided by the original X-ray pattern.

(b) "Image receptor" means any device, including a fluorescent screen and radiographic film, that transforms incident X-ray photons into a visible image or into another form that can be made into a visible image by further transformations.

(c) "Image receptor support," for mammographic systems, means that part of the system designed to support the image receptor in a horizontal plane during a mammographic examination.

(d) "Immediate" means within not more than 15 minutes or as otherwise defined in a license condition.

(e) "Incident" means an individual event or series of related events that caused or threatened to cause any violation of these regulations or license conditions. For the purposes of part 13, "incident" shall mean any unintended event involving radioactive material for which the public dose is a fraction of regulatory limits and safety provisions are sufficient, but further degradation of safety systems could lead to an accident.

(f) "Independent certifying organization" means an independent organization that meets all of the criteria specified in K.A.R. 28-35-293 [p.317].

(g) "Indian tribe" and "tribe" mean any Indian tribe, band, nation, or other organized group or community of Indians recognized as eligible for the services provided to Indians by the secretary of the United States department of the interior because of their status as Indians.

(h) "Indian tribal official" and "tribal official" mean the highest-ranking individual who represents tribal leadership, including the chief, president, and tribal council leader.

(i) "Individual" means any human being.

(j) "Individual monitoring" means the assessment of either of the following:

(1) A dose equivalent by the use of individual-monitoring devices or by the use of survey data; or
(2) a committed effective dose equivalent determined by bioassay or by computation of the number of DAC-hours to which an individual is exposed.

(k) "Individual-monitoring device" means any device designed to be worn by a single individual for the assessment of dose equivalent. "Individual-monitoring device" shall include any film badge, thermoluminescent dosimeter (TLD), optically stimulated dosimeter, pocket ionization chamber, and personal air-sampling device. For purposes of these regulations, "personnel dosimeter" and "dosimeter" shall be considered terms equivalent to "individual-monitoring device."

(l) "Industrial radiography" means the examination of the structure of materials by nondestructive methods utilizing sources of radiation.

(m) "Inherent filtration" means the filtration permanently mounted in the useful beam, including the window of the X-ray tube and any permanent tube or source enclosure.

(n) "Injection tool" means a device used for controlled subsurface injection of radioactive tracer material.

(o) "Inspection" means an official examination or observation that may include tests, surveys, and monitoring to determine compliance with federal rules, state regulations, orders, requirements, and license and registration conditions.

(p) "Installation" means the location where one or more sources of radiation are used, operated, or stored.

(q) "Interlock" means a device for precluding access by an individual to an area of radiation hazard without warning, either by preventing admission or by automatically removing the hazards.

(r) "Internal dose" means that portion of the dose equivalent received from radioactive material taken into the body.

(s) " Interruption of irradiation" means the stopping of irradiation with the possibility of continuing irradiation without the resetting of operating conditions at the control panel.

(t) "Ionizing radiation" means radiation capable of producing an ionization event, including gamma rays and X-rays, alpha and beta particles, high-speed electrons, neutrons, and other nuclear particles.

(u) "Irradiation" means the exposure of matter to ionizing radiation.
(v) "Irradiator" means a facility that uses radioactive sealed sources for the irradiation of objects or materials and in which radiation dose rates exceeding five grays (500 rads) per hour exist at one meter from the sealed radioactive sources in air or water, as applicable for the irradiator type. This term shall not include any irradiator in which both the sealed source and the area subject to irradiation are contained within a device and are not accessible to personnel.

(w) "Irradiator operator" means an individual who has successfully completed the required training and testing and is authorized by the terms of the license to operate an irradiator without a supervisor present.

(x) "Irretrievable well-logging source" means any sealed source containing licensed material that is pulled off or not connected to the wireline that suspends the source in the well and for which all reasonable effort at recovery has been expended.

(y) "Isocenter" means a fixed point in space that is located at the center of the smallest sphere through which the central axis of the beams passes under all conditions. (Authorized by K.S.A. 48-1607; implementing K.S.A. 2017 Supp. 48-1603 and K.S.A. 48-1607; effective Dec. 30, 2005; amended May 4, 2018.)

28-35-135k. Definitions. As used in these regulations, each of the following terms shall have the meaning assigned in this regulation: (a) "Kilovolts (kV)" means the energy equal to that acquired by a particle with one electron charge in passing through a potential difference of 1,000 volts in a vacuum.

(b) "Kilovolts peak (kVp)" has the meaning assigned to "peak tube potential."

(c) "kWs" means kilowatt second. This term is calculated using the following equation:

\[ kWs = \frac{(X)kV \times (Y)mA \times (Z)s \times kWs}{10^6kV \times mA \times s} = \frac{XYZ\ kWs}{10^3} \]

(Authorized by K.S.A. 48-1607; implementing K.S.A. 48-1603 and 48-1607; effective Dec. 30, 2005.)
**28-35-135l. Definitions.** As used in these regulations, each of the following terms shall have the meaning assigned in this regulation: (a) "Lead equivalent" means the thickness of lead affording the same attenuation, under specified conditions, as the material in question.

(b) "Leakage radiation" means radiation emanating from the device source assembly, except for the following:

(1) The useful beam; and

(2) radiation produced when the exposure switch or timer is not activated for diagnosis or therapy.

(c) "Leakage technique factors" means the technique factors associated with the tube housing assembly that are used in measuring leakage radiation. The leakage technique factors shall be defined as follows:

(1) For diagnostic source assemblies intended for capacitor energy storage equipment, the maximum rated number of exposures in an hour for operation at the maximum rated peak tube potential, with the quantity of charge per exposure being 10 millicoulombs or the minimum obtainable from the unit, whichever is larger;

(2) for diagnostic source assemblies intended for field emission equipment rated for pulsed operation, the maximum rated number of X-ray pulses in an hour for operation at the maximum rated peak tube potential; and

(3) for all other diagnostic or therapeutic source assemblies, the maximum rated peak tube potential and the maximum rated continuous tube current for the maximum rated peak tube potential.

(d) "License" means a document issued in accordance with these regulations specifying the conditions of use of radioactive material.

(e) "Licensed or registered material" means radioactive material received, possessed, used, transferred, or disposed of under a general or specific license or registration issued by the department.

(f) "Licensee" means any person who is licensed in accordance with these regulations.

(g) "Licensing state" means any state that has been granted final designation by the conference of radiation control program directors, inc., for the regulatory control of NARM, as defined in K.A.R. 28-35-135n [p.27].

(h) "Light field" means that area of the intersection of the light beam from the beam-limiting device and one plane in 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.

(i) "Line-voltage regulation" means the difference between the no-load and the load line potentials, expressed as a percent of the load line potential, using the following equation:

\[ \text{Percent line-voltage regulation} = \frac{100 (V_n - V_l)}{V_l} \]

where

\[ V_n = \text{No-load line potential and} \]
\[ V_l = \text{Load line potential.} \]

(j) "Local component" means any part of an analytical X-ray system. This term shall include components that are struck by X-rays, including radiation source housings, port and shutter assemblies, collimators, sample holders, cameras, goniometers, detectors, and shielding. This term shall not include power supplies, transformers, amplifiers, readout devices, and control panels.

(k) "Logging supervisor" means the individual who uses sources of radiation or provides personal supervision of the utilization of sources of radiation at a well site.

(l) "Logging tool" means a device used subsurface to perform well logging.

(m) "Lost or missing licensed or registered source of radiation" means a licensed or registered source of radiation whose location is unknown. This term shall include licensed or registered material that has been shipped but has not reached its planned destination and whose location cannot be readily traced in the transportation system.

(n) "Lot tolerance percent defective" means the poorest quality, expressed as the percentage of defective units, in an individual inspection lot that may be accepted.

(o) "Low dose-rate remote afterloader" means a brachytherapy device that remotely delivers a dose rate of less than or equal to two grays per hour at the point or surface where the dose is prescribed. (Authorized by K.S.A. 48-1607; implementing K.S.A. 48-1603 and 48-1607; effective Dec. 30, 2005; amended March 18, 2011.)
28-35-135m. Definitions. As used in these regulations, each of following terms shall have the meaning assigned in this regulation: (a) "mA" means milliampere.

(b) "Major processor" means a user processing, handling, or manufacturing radioactive material exceeding type A quantities as unsealed sources or material, or exceeding four times the type B quantities as sealed sources. This term shall not include nuclear medicine programs, universities, industrial radiographers, and small industrial programs. Type A and B quantities are specified in K.A.R. 28-35-221b [p.224] of these regulations.

(c) "Management" means the chief executive officer or other individual having the authority to manage, direct, or administer the licensee's activities, or that person's delegate or delegates.

(d) "Manual brachytherapy" means a type of brachytherapy in which the brachytherapy sources, including seeds and ribbons, are manually placed topically on or inserted either into the body cavities that are in close proximity to a treatment site or directly into the tissue volume.

(e) "mAs" means the product of milliamperes and seconds.

(f) "Maximum line current" means the rootmean-square current in the supply line of an Xray machine operating at its maximum rating.

(g) "Medical event" means an event that meets the criteria specified in part 6 of these regulations.

(h) "Medical institution" means an organization in which several medical disciplines are practiced.

(i) "Medical use" means the intentional internal or external administration of radioactive material, or radiation, to humans in the practice of the healing arts.

(j) "Medium dose-rate remote afterloader" means a brachytherapy device that remotely delivers a dose rate of greater than two grays, but less than 12 grays per hour at the point or surface where the dose is prescribed.

(k) "Megavolt (MV)" means the energy equal to that acquired by a particle with one electron charge in passing through a potential difference of one million volts in a vacuum.

(l) "Member of the public" means an individual, except when that individual is receiving an occupational dose.

(m) "Mineral logging" means logging performed for the purpose of mineral exploration other than oil or gas.
(n) "Minor" means an individual younger than 18 years of age.

(o) "Mobile nuclear medicine service" means the transportation and medical use of radioactive material.

(p) "Mobile X-ray equipment" means X-ray equipment mounted on a permanent base with wheels or casters, or both, for moving while completely assembled. This term shall include X-ray equipment mounted in a vehicle.

(q) "Monitoring" means the measurement of radiation, radioactive material concentrations, surface area activities, or quantities of radioactive material and the use of the results of these measurements to evaluate potential exposures and doses. For purposes of these regulations, "radiation monitoring" and "radiation protection monitoring" shall be considered terms equivalent to "monitoring."

(r) "Moving beam therapy" means radiation therapy with relative displacement of the useful beam and the patient during irradiation, including therapy, skip therapy, and rotational therapy.

(Authorized by K.S.A. 48-1607; implementing K.S.A. 48-1603 and 48-1607; effective Dec. 30, 2005.)

28-35-135n. Definitions. As used in these regulations, each of the following terms shall have the meaning assigned in this regulation: (a) "NARM" means any naturally occurring or accelerator-produced radioactive material, not including byproduct, source, or special nuclear material.

(b) "Nationally tracked source" means a sealed source containing any quantity of radioactive material equal to or greater than any threshold listed in the table in this subsection. For purposes of the definition of "nationally tracked source," "sealed source" shall be defined as radioactive material that is sealed in a capsule or closely bonded, that is in a solid form, and that is not exempt from regulatory control. For purposes of the definition of "nationally tracked source," "sealed source" shall not include any radioactive material encapsulated solely for disposal and any nuclear material contained in any fuel assembly, subassembly, fuel rod, or fuel pellet. Category 1 nationally tracked sources contain radioactive material in quantities equal to or greater than the category 1 threshold. Category 2 nationally tracked sources contain radioactive material
in quantities equal to or greater than the category 2 threshold but less than the category 1 threshold.

### Nationally tracked source thresholds

<table>
<thead>
<tr>
<th>Rad material</th>
<th>Cat 1 (TBq*, Ci**)</th>
<th>Cat 2 (TBq*, Ci**)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actinium-227</td>
<td>20</td>
<td>0.2</td>
</tr>
<tr>
<td>Americium-241</td>
<td>60</td>
<td>0.6</td>
</tr>
<tr>
<td>Americium-241/Be</td>
<td>60</td>
<td>0.6</td>
</tr>
<tr>
<td>Californium-252</td>
<td>20</td>
<td>0.2</td>
</tr>
<tr>
<td>Cobalt-60</td>
<td>30</td>
<td>0.3</td>
</tr>
<tr>
<td>Curium-244</td>
<td>50</td>
<td>0.5</td>
</tr>
<tr>
<td>Cesium-137</td>
<td>100</td>
<td>1</td>
</tr>
<tr>
<td>Gadolinium-153</td>
<td>1,000</td>
<td>10</td>
</tr>
<tr>
<td>Iridium-192</td>
<td>80</td>
<td>0.8</td>
</tr>
<tr>
<td>Plutonium-238</td>
<td>60</td>
<td>0.6</td>
</tr>
<tr>
<td>Plutonium-239/Be</td>
<td>60</td>
<td>0.6</td>
</tr>
<tr>
<td>Polonium-210</td>
<td>60</td>
<td>0.6</td>
</tr>
<tr>
<td>Promethium-147</td>
<td>40,000</td>
<td>400</td>
</tr>
<tr>
<td>Radium-226</td>
<td>40</td>
<td>0.4</td>
</tr>
<tr>
<td>Selenium-75</td>
<td>200</td>
<td>2</td>
</tr>
<tr>
<td>Strontium-90</td>
<td>1,000</td>
<td>10</td>
</tr>
<tr>
<td>Thorium-228</td>
<td>20</td>
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<tr>
<td>Thorium-229</td>
<td>20</td>
<td>0.2</td>
</tr>
<tr>
<td>Thulium-170</td>
<td>20,000</td>
<td>200</td>
</tr>
<tr>
<td>Ytterbium-169</td>
<td>300</td>
<td>3</td>
</tr>
</tbody>
</table>
*The Terabecquerel (TBq) values are the regulatory standard.

**The curie (Ci) values specified are obtained by converting from the TBq value. The curie values are provided for practical usefulness only and are rounded after conversion.

(c) "Natural radioactivity" means the radioactivity of naturally occurring nuclides.

(d) "New equipment" means any system subject to K.A.R. 28-35-249 [p.288] that was manufactured after January 1, 1985.

(e) "Nonionizing radiation" means radiation not capable of producing ionization, including sound and radio waves and visible, infrared, or ultraviolet light.

(f) "Non-stochastic effect" means a health effect, the severity of which varies with the dose and for which a threshold is believed to exist. For purposes of these regulations, "deterministic effect" shall be considered an equivalent term.

(g) "Normal operating procedures" means operating procedures for conditions suitable for routine purposes with shielding and barriers in place, including routine alignment procedures. This term shall not include maintenance procedures and routine and emergency radiation safety considerations.

(h) "Normal treatment distance" means either of the following:

1. For electron irradiation, the distance from the virtual source to the surface along the central axis of the useful beam, as specified by the manufacturer; or

2. For X-ray irradiation, the distance from the virtual source to the isocenter along the central axis of the useful beam. For non-isocentric equipment, this distance shall be the distance specified by the manufacturer.

(i) "Nuclear regulatory commission (NRC)" means the U.S. nuclear regulatory commission or its duly authorized representatives.

28-35-135o. Definitions. As used in these regulations, each of the following terms shall have the meaning assigned in this regulation:

(a) "Occupational dose" means the dose received by an individual in the course of employment in which the individual's assigned duties involve exposure to radiation or radioactive material from licensed or unlicensed sources of radiation. The term "occupational dose" shall not include any dose received under any of the following circumstances:
   (1) As background radiation;
   (2) as a patient from medical practices;
   (3) from voluntary participation in medical research programs; or
   (4) as a member of the public.

(b) "Off-site response organization" means any non-licensee off-site organization that could be needed to respond to an emergency, including local fire, police, ambulance, and hospital emergency management services.

(c) "Open-beam configuration" means an X-ray system in which an individual could accidentally place some part of the individual's body in the primary beam path during normal operation.

(d) "Output" means the exposure rate or dose rate, or a quantity related in a known manner to these rates from a teletherapy unit for a specified set of exposure conditions. (Authorized by K.S.A. 48-1607; implementing K.S.A. 48-1603 and 48-1607; effective Dec. 30, 2005.)

28-35-135p. Definitions. As used in these regulations, each of the following terms shall have the meaning assigned in this regulation:

(a) "Package" means a container and packing material, together with the radioactive contents, as presented for transport.

(b) "Panoramic dry-source-storage irradiator" means an irradiator in which the irradiations occur in air in areas potentially accessible to personnel and in which the sources are stored in shields made of solid materials. This term shall include beam-type dry-source-storage irradiators in which one narrow beam of radiation is produced for performing irradiations.

(c) "Panoramic wet-source-storage irradiator" means an irradiator in which the irradiations occur in air in areas potentially accessible to personnel and in which the sources are stored underwater in a storage pool.
(d) "Particle accelerator" means any machine capable of accelerating electrons, protons, deuterons, or other charged particles in a vacuum and of discharging the resultant particulate or other radiation into a medium at energies usually in excess of one mega electron volt (MeV).

(e) "Patient" means an individual subjected to examination, diagnosis, or treatment.

(f) "Patient intervention" means any action by the patient or human research subject, whether intentional or unintentional, that affects the prescribed treatment. This term shall include dislodging or removing any treatment device and prematurely terminating the prescribed treatment.

(g) "Peak tube potential" means the maximum value of the potential differences across an X-ray tube during an exposure. This term is also referred to as "kilovolts peak (kVp)."

(h) "Periodic quality-assurance check" means a procedure that is performed to ensure that the previous calibration continues to be valid.

(i) "Permanent radiographic installation" means an enclosed, shielded room, cell, or vault, not located at a temporary job site, in which radiography is performed.

(j) "Person" means any individual, corporation, partnership, firm, association, trust, estate, public or private institution, group, agency, political subdivision of this or any other state, or political subdivision or agency, excluding federal government agencies.

(k) "Personnel-monitoring equipment" means any device designed to be carried or worn by an individual and used to measure the exposure of that individual to radiation. For purposes of these regulations, "PMD," which means "personnel-monitoring device," shall be an equivalent term.

(l) "Personnel supervision" means guidance and instruction by the supervisor who is physically present at the job site and who is watching the performance of the operation in such proximity that contact can be maintained and immediate assistance given, as required.

(m) "Phantom" means a volume of material behaving in a manner similar to that of tissue, with respect to the attenuation and scattering of radiation.
(n) "Pharmacist" means any individual licensed to practice pharmacy under K.S.A. 65-1626 et seq., and amendments thereto.

(o) "Phototimer" means a device used for controlling radiation exposures to image receptors by limiting the amount of radiation that reaches a radiation-monitoring device or devices. The radiation-monitoring device or devices are part of an electronic circuit that controls the period of time during which the tube is activated. For purposes of these regulations, "automatic exposure control" is an equivalent term.

(p) "Physician" means any individual licensed to practice the healing arts specified in K.S.A. 65-2869, K.S.A. 65-2870, or K.S.A. 65-2871, and amendments thereto.

(q) "Planned special exposure" means an infrequent exposure to radiation, separate from and in addition to the annual occupational dose limits.

(r) "Podiatry" means the activities authorized and specified in K.S.A. 65-2001 et seq., and amendments thereto.

(s) "Pool irradiator" means any irradiator at which the sources are stored or used in a pool of water, including panoramic wet-source-storage irradiators and underwater irradiators.

(t) "Portable X-ray equipment" means X-ray equipment designed to be hand-carried.

(u) "Position indication device (PID)" means a device on dental X-ray equipment used to indicate the beam position and to establish a definite source-to-skin-surface distance. A PID can incorporate or serve as a beam-limiting device.

(v) "Positive beam limitation" means the automatic or semiautomatic adjustment of an X-ray beam to the size of the selected image receptor. Exposures cannot be made without this adjustment.

(w) "Practical examination" means a demonstration by personnel through the application of safety principles, including the use of all procedures and equipment.

(x) "Preceptor" means an individual who provides or directs the training and experience required for another individual to become an authorized user, an authorized medical physicist, an authorized nuclear pharmacist, or a radiation safety officer.

(y) "Prescribed dosage" means the quantity of radiopharmaceutical activity documented as follows:

(1) In a written directive; or
(2) either in the diagnostic clinical procedures manual or in any appropriate record in accordance with the directions of the authorized user for diagnostic procedures.

(z) "Prescribed dose" means any of the following:

(1) For gamma stereotactic radiosurgery, the total dose as documented in the written directive;

(2) for teletherapy, the total dose and dose per fraction as documented in the written directive; or

(3) for brachytherapy, either the total source strength and exposure time or the total dose, as documented in the written directive.

This term shall not apply to part 6 of these regulations.

(aa) "Primary beam" means ionizing radiation that passes through an aperture of the source housing by a direct path from the X-ray tube or a radioactive source located in the radiation source housing.

(bb) "Primary dose-monitoring system" means a system that monitors the useful beam during irradiation and that terminates irradiation when a preselected number of dose monitor units are acquired.

(cc) "Primary protective barrier" means a barrier of attenuating materials used to reduce the useful X-ray beam to the required degree.

(dd) "Product conveyor system" means a system for moving the product to be irradiated to, from, and within the area where irradiation takes place.

(ee) "Projected dose" means a future dose calculated for a specified time period on the basis of estimated or measured initial concentrations of radionuclides or exposure rates and in the absence of protective actions.

(ff) "Protective action" means an action taken by members of the public to protect themselves from radiation from an accident involving radioactive material. This term may include sheltering, evacuation, relocation, control of access, administration of a radioprotective drug, decontamination of persons, decontamination of land or property, and controls placed on food or water.

(gg) "Protective action guide" means a projected dose from an accidental release of radioactive material at which protective action may be considered.
(hh) "Protective apron" means an apron made of radiation-absorbing materials used to reduce radiation exposure.

(ii) "Protective barrier" means a barrier of attenuating materials used to reduce radiation exposure to the required degree.

(jj) "Protective glove" means a glove made of radiation-absorbing materials used to reduce radiation exposure.

(kk) "Public dose" means the dose received by a member of the public from exposure to radiation, radioactive material released by a licensee or registrant, or any other source of radiation under the control of the licensee or registrant. This term shall not include an occupational dose, a dose received from background radiation, a dose received as a patient from medical practices, and a dose received from voluntary participation in a medical research program.

(ll) "Pulse dose-rate remote afterloader" means a special type of remote afterloading brachytherapy device that meets all of the following condition

(1) The device uses a single source capable of delivering more than 12 grays per hour.
(2) The source activity of the device is approximately one-tenth of the activity of typical high dose-rate remote afterloader sources.
(3) The device is used to stimulate the radiobiology of a low dose-rate treatment by inserting the source for a given fraction of each hour.

(mm) "Pyrophoric liquid" means any liquid that ignites spontaneously in dry or moist air at or below 130° F (54.4° C).

(nn) "Pyrophoric solid" means any solid material, other than one classified as an explosive, that under normal conditions results in the following:

(1) Is liable to cause fires through friction or retained heat from manufacturing or processing;
(2) is ignited readily; and
(3) if ignited, burns vigorously and persistently enough to create a serious transportation, handling, or disposal hazard, including spontaneously combustible and water-reactive materials.

28-35-135q. Definitions. As used in these regulations, each of the following terms shall have the meaning assigned in this regulation: (a) "Qualified expert" means an individual having the knowledge and training to measure ionizing radiation, to evaluate safety techniques, and to advise regarding radiation protection needs.

(1) This term shall include any individual certified in the appropriate field by any of the following, or an individual with equivalent qualifications as determined by the secretary:

(A) The American board of radiology;
(B) the American board of health physics; or
(C) the American board of medical physics.

(2) With reference to the calibration of radiation therapy equipment, this term shall include any individual having, in addition to the qualifications specified in paragraph (1) of this subsection, training and experience in the clinical applications of radiation physics to radiation therapy, including any individual certified in either of the following, or an individual with equivalent qualifications as determined by the secretary:

(A) Therapeutic radiological physics by the American board of radiology; or
(B) X-ray and radium physics by the American board of radiology.

(b) "Quality factor (Q)" means the modifying factor, as listed in tables I and II in K.A.R. 28-35-144a [p.56], used to derive the dose equivalent from the absorbed dose.

(c) "Quarter" means a period of time that is equal to one-fourth of the year and is approximately 13 consecutive weeks. The beginning of the first quarter in each year shall coincide with the starting date of the year, and no day shall be omitted or duplicated in consecutive quarters. (Authorized by K.S.A. 48-1607; implementing K.S.A. 48-1603 and 48-1607; effective Dec. 30, 2005.)

28-35-135r. Definitions. As used in these regulations, each of the following terms shall have the meaning assigned in this regulation: (a) "Rad" means the unit of absorbed dose. One rad equals one-hundredth of a joule per kilogram of material or the
absorption of 100 ergs per gram of material. One millirad (mrad) equals 0.001 rad.

(b) "Radiation area" means any area that is accessible to individuals, in which there exists radiation at such levels that, at 30 centimeters from the source of the radiation or any surface that the radiation penetrates, an individual could receive a dose equivalent in excess of five millirems in one hour.

(c) "Radiation detector" means a device that, in the presence of radiation, provides a signal or other indication suitable for use in measuring one or more quantities of incident radiation.

(d) "Radiation head" means the structure from which the useful beam emerges.

(e) "Radiation machine" means either of the following:
   (1) Any device that is primarily intended to produce, and is capable of producing, ionizing radiation; or
   (2) any device that is not primarily intended to produce, but does produce, ionizing radiation at a level greater than 0.5 mR/hr at any point five centimeters from its surface.

   This term shall not mean any device that produces ionizing radiation only by use of radioactive materials.

(f) "Radiation room" means a shielded room in which irradiations take place. Underwater irradiators shall not be deemed to have radiation rooms.

(g) "Radiation safety officer" means an individual directly responsible for radiation protection. This term shall not apply to part 6 of these regulations.

(h) "Radiation therapy simulation system" means a radiographic or fluoroscopic X-ray system intended for localizing the volume of tissue to be exposed during radiation therapy and confirming the position and size of the therapeutic irradiation field.

(i) "Radioactive marker" means radioactive material placed subsurface or on a structure intended for subsurface use for the purpose of depth determination or direction orientation.

(j) "Radioactive material" means any material, in any chemical or physical form, that emits radiation spontaneously.

(k) "Radioactivity" means the disintegration of unstable atomic nuclei by the emission of radiation.

(l) "Radiograph" means an image receptor on which the image is created directly or indirectly by an X-ray pattern that results in a permanent record.
(m) "Radiographer" means any individual who meets the following conditions:

(1) Performs nonmedical radiographic operations or, while in attendance at the site where those radiographic operations are being performed, personally supervises the operations; and

(2) is responsible to the licensee or registrant, or both, for ensuring compliance with the requirements of these regulations or the conditions of the license, including any specific authorization by the department to provide training to radiographic trainees.

(n) "Radiographer certification" means the written approval received from a certifying entity stating that an individual has satisfactorily met the radiation safety, testing, and experience criteria.

(o) "Radiographer's assistant" means any individual who, under the personal supervision of a radiographer, uses radiation machines, radiographic exposure devices, sealed sources, or related handling tools or survey instruments in industrial radiography.

(p) "Radiographic exposure device" means any instrument with a sealed source fastened or contained in the instrument in which the sealed source or shielding of the source can be moved or otherwise changed from a shielded to unshielded position for purposes of making a radiographic exposure.

(q) "Radiographic imaging system" means any system that produces a permanent or semipermanent image on an image receptor by the action of ionizing radiation.

(r) "Radiographic operations" means all activities performed with a radiographic exposure device or with a radiation machine. These activities shall include the following:

(1) Transporting, except by common or contract carriers;

(2) storing at a temporary job site;

(3) performing surveys to confirm the adequacy of boundaries;

(4) setting up equipment; and

(5) any activity performed inside restricted area boundaries. This term shall not include transporting a radiation machine.

(s) "Radiological physicist" means an individual who meets at least one of the following requirements:

(1) Is certified by the American board of radiology in any of the following:
(A) Therapeutic radiological physics;
(B) roentgen ray and gamma ray physics;
(C) X-ray and radium physics; or
(D) radiological physics;
(2) is certified by the American board of medical physics in radiation oncology physics; or
(3) (A) Holds a master's or doctoral degree in physics, biophysics, radiological physics, or health physics; and
    (B) has completed one year of full-time training in therapeutic radiological physics and an additional year of full-time work experience under the supervision of teletherapy physicist at a medical institution that includes duties that involve performing calibration and spot checks of a medical accelerator or a sealed source teletherapy unit.
(t) "Rating" means the operating limits specified by the component manufacturer.
(u) "Recordable event" means the administration of any of the following:
    (1) A radiopharmaceutical or radiation without a written directive if a written directive is required;
    (2) a radiopharmaceutical or radiation if a written directive is required, without the daily recording of each administered radiopharmaceutical dosage or radiation dose in the appropriate record;
    (3) a radiopharmaceutical dosage greater than 1.11 megabecquerels (30 uCi) of sodium iodide I-125 or I-131 if the administered dosage of both differs from the prescribed dosage by more than 10 percent of the prescribed dosage and if the difference between the administered dosage and the prescribed dosage exceeds 555 kilobecquerels (15 uCi);
    (4) a therapeutic radiopharmaceutical dosage, other than sodium iodide I-125 or I-131, if the administered dosage differs from the prescribed dosage by more than 10 percent of the prescribed dosage;
    (5) a teletherapy radiation dose if the calculated weekly administered dose exceeds the weekly prescribed dose by 15 percent or more of the weekly prescribed dose; or
    (6) a brachytherapy radiation dose if the calculated administered dose differs from the prescribed dose by more than 10 percent of the prescribed dose.
(v) "Recording" means producing a permanent form of an image resulting from X-ray photons.

(w) "Redundant beam-monitoring system" means a combination of two dose-monitoring systems in which each system is designed to terminate irradiation in accordance with a preselected number of dose monitor units.

(x) "Reference man" means a hypothetical aggregation of human physical and physiological characteristics determined by international consensus. These characteristics may be used by researchers and public health workers to standardize the results of experiments and to relate biological damage to a common base.

(y) "Registrable item" means any radiation machine.

(z) "Registrant" means any person who is registered with the department and is legally obligated to register with the department according to these regulations.

(aa) "Registration" means the process of completing and filing forms with the department as required by these regulations.

(bb) "Relocation" means the removal or, after a plume has passed, the continued exclusion of people from contaminated areas to avoid a chronic radiation dose.

(cc) "Rem" means the special unit of any of the quantities expressed as dose equivalent. One millirem (mrem) equals 0.001 rem.

(dd) "Research and development" means either of the following:

1. Theoretical analysis, exploration, or experimentation; or
2. The extension of investigating findings and theories of a scientific or technical nature into practical application for experimental purposes, including the experimental production and testing of models, devices, equipment, materials, and processes.

Research and development, as used in these regulations, shall not include the internal or external administration of radiation or radioactive materials to any individual.

(ee) "Respiratory protective equipment" means any apparatus used to reduce an individual's intake of airborne radioactive materials.

(ff) "Response time" means the time required for an instrument system to reach 90 percent of its final reading when the radiation-sensitive volume of the instrument system is exposed to a
step change in radiation flux from zero to a level sufficient to
provide a steady-state midscale reading.

(gg) "Restricted area" means any area to which the access is
limited by the licensee or registrant to protect individuals against
undue risks from exposure to sources of radiation. This term shall
not include areas used as residential quarters. However, separate
rooms in a residential building may be set apart and designated as a
restricted area. (Authorized by K.S.A. 48-1607; implementing
K.S.A. 48-1603 and 48-1607; effective Dec. 30, 2005; amended
July 27, 2007.)

28-35-135s. Definitions. As used in these regulations, each
of the following terms shall have the meaning specified in this
regulation: (a) "Sanitary sewerage" means a system of public sewers
to carry off waste water and refuse. This term shall exclude sewage
treatment facilities, septic tanks, and leach fields owned or operated
by the licensee or registrant.

(b) "Scattered radiation" means radiation that, during its
passage through matter, is deviated in direction.

(c) "Sealed source" means any radioactive material that is
permanently encased in a capsule designed to prevent the leakage or
escape of the radioactive material.

(d) "Secondary dose-monitoring system" means a system
that terminates irradiation if the primary system fails.

(e) "Secondary protective barrier" means a barrier sufficient
to attenuate stray radiation to the required degree.

(f) "Secretary" means secretary of the department of health
and environment.

(g) "Seismic area" means any area where the probability of
a horizontal acceleration in rock of more than 0.3 times the
acceleration of gravity in 250 years is greater than 10 percent, as
designated by the U.S. geological survey.

(h) "Shallow dose equivalent" and "$H_s$," which apply to the
external exposure of the skin or an extremity, mean the dose
equivalent at a tissue depth of 0.007 centimeter ($7 \text{ mg/cm}^2$) averaged
over an area of one square centimeter.

(i) "Sheltering" means using a structure for radiation
protection from an airborne plume containing radioactive material.

(j) "Shielded position" means the location within the
radiographic exposure device or storage container that, by the
manufacturer's design, is the proper location for storage of the sealed source.

(k) "Shielded-room radiography using radiation machines" means industrial radiography using radiation machines that meets the following conditions:

1. Is conducted in an enclosed room, the interior of which is not occupied during radiographic operations;
2. is shielded so that every location on the exterior meets the conditions specified in K.A.R. 28-35-214a [p.206]; and
3. is accessible only through openings that are interlocked so that the radiation machine will not operate unless all openings are securely closed.

(l) "SI" means the abbreviation for the international system of units.

(m) "Shutter" means a device attached to an X-ray 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.

(n) "Sievert" means the SI unit of any of the quantities expressed as a dose equivalent. The dose equivalent in sieverts is equal to the absorbed dose in grays multiplied by the quality factor (1 Sv = 100 rem).

(o) "Site area emergency" means an event that could occur, is in progress, or has occurred, that could lead to a significant release of radioactive material, and that could require a response by off-site response organizations to protect persons off-site.

(p) "Site boundary" means that line beyond which the land or property is not owned, leased, or otherwise controlled by the licensee or registrant.

(q) "Source" means the focal spot of the X-ray tube.

(r) "Source assembly" means an assembly that consists of the sealed source and a connector that attaches the source to the control cable.

(s) "Source changer" means a device designed and used for replacement of sealed sources in radiographic exposure devices, including those devices also used for transporting and storing sealed sources.
(t) "Source holder" means a housing or assembly into which a radioactive source is placed for the purpose of facilitating the handling and use of the source in well-logging operations.

(u) "Source-image receptor distance" and "SID" mean the distance from the source to the center of the input surface of the image receptor.

(v) "Source material" means the following:

1. Uranium or thorium, or any combination of these, in any physical or chemical form; or
2. Ores that contain, by weight, 0.05 percent or more of uranium, thorium, or any combination of these. The term "source material" shall not include special nuclear material.

(w) "Source material milling" means any activity that results in the production of by-product material.

(x) "Source of radiation" means any material, device, or equipment that emits or is capable of producing radiation.

(y) "Source-to-skin distance" and "SSD" mean the distance between the source and the patient's skin.

(z) "Special form" means any licensed material that meets either of the following conditions:

1. (A) Is in solid form;
   (B) has at least one dimension measuring at least five millimeters;
   (C) does not melt, sublime, or ignite in air at a temperature of 1,000°F
   (D) does not shatter or crumble if subjected to the percussion test described in K.A.R. 28-35-144 [p.55]; and
   (E) is not dissolved or converted into dispensible form to the extent of more than 0.005 percent by weight by immersion for one week in water at 68°F or in air at 86°F; or
2. (A) Is in any physical form securely contained in a capsule;
   (B) has at least one dimension measuring at least five millimeters;
   (C) will retain its contents if subjected to the tests described in K.A.R. 28-35-144 [p.55]; and
   (D) is constructed of materials that do not melt, sublime, or ignite in air at 1,475°F and do not dissolve or convert into dispensible form to the extent of more than 0.005 percent by weight by immersion for one week in water at 68°F or in air at 86°F.
(aa) "Special nuclear material" means either of the following:

1. Plutonium, uranium-223, uranium enriched in the isotope 233 or in the isotope 235, and any other material that the department declares by order to be special nuclear material after the nuclear regulatory commission (NRC), pursuant to the provisions of section 51 of the atomic energy act of 1954, has determined the material to be special nuclear material, except for source material; or

2. any material artificially enriched as specified in paragraph (aa)(1), except for source material.

(bb) "Special nuclear material in quantities not sufficient to form a critical mass" means any of the following:

1. Uranium enriched in the isotope U-235, in quantities not exceeding 350 grams of contained U-235;

2. uranium enriched in the isotope uranium-233, in quantities not exceeding 200 grams of contained U-233;

3. plutonium not exceeding 200 grams; or

4. any combination of these special nuclear materials in accordance with the following formula:

\[
\frac{\text{grams of contained U-235}}{350} + \frac{\text{grams of contained U-233}}{200} + \frac{\text{gram of Pu}}{200} \leq 1
\]

The sum of the ratios for all of the kinds of special nuclear material in combination shall not exceed one.

(cc) "Spot check" means a procedure that is performed to ensure that a previous calibration continues to be valid.

(dd) "Spot film" means a radiograph that is made during a fluoroscopic examination or radiation therapy treatment to permanently record conditions that exist during the procedure.

(ee) "Spot-film device" means a device intended either to transport and position a radiographic image receptor between the radiation source and image receptor or to position a radiographic image receptor between the radiation source and image receptor. This term shall include a device intended to hold a cassette over the input end of an image intensifier for the purpose of making a radiograph.
(ff) "Stationary beam therapy" means radiation therapy without relative displacement of the useful beam and the patient during irradiation.

(gg) "Stationary X-ray equipment" means X-ray equipment that is installed in a fixed location.

(hh) "Stereotactic radiosurgery" means the use of external radiation in conjunction with a stereotactic guidance device to very precisely deliver a therapeutic dose to a tissue volume.

(ii) "Stochastic effect" means a health effect that occurs randomly and for which the probability of the occurrence of the effect, rather than the severity of the effect, is assumed to be a linear function of dose without threshold. For purposes of these regulations, "probabilistic effect" shall be considered an equivalent term.

(jj) "Storage area" means any location, facility, or vehicle that is used to store, transport, or secure a radiographic exposure device, radiation machine, storage container, or sealed source when not in use. Each storage area shall be locked or have physical barriers to prevent accidental exposure, tampering, or unauthorized removal of the device, machine, sealed source, or container.

(kk) "Storage container" means a device in which radioactive materials are transported or stored.

(II) "Stray radiation" means the sum of leakage radiation and scattered radiation.

(mm) "Structured educational program" means an educational program designed to impart particular knowledge and practical education through interrelated studies and supervised training.

(nn) "S-tube" means a tube through which the radioactive source travels when inside a radiographic exposure device.

(oo) "Subsurface studies" means the evaluation of parameters below the surface of the earth.

(pp) "Subsurface tracer study" means the release of a substance tagged with radioactive material for the purpose of tracing the movement or position of the tagged substance in the well bore or adjacent formation.

(qq) "Survey" means an evaluation of a radiation hazard resulting from the production, use, transfer, release, disposal, or presence of sources of radiation. This term shall include a physical survey of the location of materials or equipment, or both, and either
the measurements of levels of radiation or the concentrations or quantities of radioactive materials present. (Authorized by K.S.A. 48-1607; implementing K.S.A. 2017 Supp. 48-1603 and K.S.A. 48-1607; effective Dec. 30, 2005; amended May 4, 2018.)

**28-35-135t. Definitions.** As used in these regulations, each of the following terms shall have the meaning assigned in this regulation: (a) "Target" means the part of a radiation head that by design intercepts a beam of accelerated particles, with the subsequent emission of other radiation.

(b) "Target-to-skin distance (TSD)" means the distance measured along the beam axis from the center of the front surface of the X-ray target or electron virtual source to the irradiated object or patient.

(c) "Technique factors" means the conditions of operation specified as follows:

1. For capacitor energy storage equipment, peak tube potential in kV and quantity of charge in mAs;
2. for field emission equipment rated for pulsed operation, peak tube potential in kV and number of X-ray pulses; and
3. for all equipment not specified in paragraphs (c)(1) and (2), peak tube potential in kV and either the tube current in mA and the exposure time in seconds or the product of the tube current and the exposure time in mAs.

(d) "Teletherapy" means therapeutic irradiation in which the source of radiation is located at a distance from the body.

(e) "Teletherapy physicist" means an individual identified as the qualified teletherapy physicist on a department license.

(f) "Temporary job site" means a location where operations are performed and where sources of radiation may be stored, other than the location or locations of use authorized on the license or registration.

(g) "Tenth-value layer (TVL)" means the thickness of a specified material that attenuates X-radiation or gamma radiation to the extent that the air kerma rate, exposure rate, or absorbed dose rate is reduced to one-tenth of the value measured without the material at the same point.
(h) "Termination of irradiation" means the stopping of irradiation in a fashion not permitting the continuance of irradiation without the resetting of operating conditions at the control panel.

(i) "Test" means the process of verifying compliance with an applicable regulation.

(j) "Therapeutic dosage" means a dosage of unsealed by-product material that is intended to deliver a radiation dose to a patient or human research subject for palliative or curative treatment.

(k) "Therapeutic dose" means a radiation dose delivered from a source containing by-product material to a patient or human research subject for palliative or curative treatment.

(l) "Therapeutic-type tube housing" means the following:

(1) For X-ray equipment not capable of operating at 500 kVp or above, an X-ray tube housing constructed so that the leakage radiation, at a distance of one meter from the source, does not exceed one roentgen in an hour when the tube is operated at its maximum rated continuous current for the maximum rated tube potential; and

(2) for X-ray equipment capable of operating at 500 kVp or above, an X-ray tube housing constructed so that the leakage radiation, at a distance of one meter from the source, does not exceed 0.1 percent of the useful beam dose rate at one meter from the source for any of the tube's operating conditions.

Areas of reduced protection shall be acceptable if the average reading over any area of 100 cm², at a distance of one meter from the source, does not exceed any of the values specified in this subsection.

(m) "These regulations" means article 35 in its entirety.

(n) "Tomogram" means the depiction of the X-ray attenuation properties of a section through the body.

(o) "Total effective dose equivalent" and "TEDE" mean the sum of the effective dose equivalent for external exposures and the committed effective dose equivalent for internal exposures.

(p) "Total organ dose equivalent" and "TODE" mean the sum of the deep dose equivalent and the committed dose equivalent delivered to the organ receiving the highest dose.

(q) "Traceable to a national standard" means that a quantity or a measurement has been compared to a national standard directly or indirectly through one or more intermediate steps and that all comparisons are documented.
(r) "Transport index" means the dimensionless number, rounded up to the first decimal place, placed on the label of a package to designate the degree of control to be exercised by the carrier during transportation. The transport index is the maximum radiation level in millirems per hour at one meter from the external surface of the package.

(s) "Tritium neutron-generator-target source" means a tritium source used within a neutron generator tube to produce neutrons for use in welllogging applications.

(t) "Tube" means an X-ray tube, unless otherwise specified.

(u) "Tube housing assembly" means the tube housing with a tube installed, including high-voltage transformers or filament transformers, or both, and other appropriate elements when contained within the tube housing.

(v) "Treatment site" means the anatomical description of the tissue intended to receive a radiation dose, as specified in a written directive.

(w) "Tube rating chart" means the set of curves that describes the rated limits of operation of the tube in terms of the technique factors.

(x) "Type A package" means packaging that, together with the radioactive contents limited to $A_1$ or $A_2$ as appropriate, is designed to retain the integrity of containment and shielding under normal conditions of transport as demonstrated by the tests specified in 49 CFR 173.465 or 49 CFR 173.466, as appropriate.

(y) "Type B package" and "type B transport container" mean packaging that meets the applicable requirements specified in 10 CFR 71.51. (Authorized by K.S.A. 48-1607; implementing K.S.A. 48-1603 and 48-1607; effective Dec. 30, 2005; amended March 18, 2011.)

**28-35-135u. Definitions.** As used in these regulations, each of the following terms shall have the meaning specified in this regulation: (a) "Underwater irradiator" means an irradiator in which the sources always remain shielded underwater and humans do not have access to the sealed sources or the space that is subject to irradiation without entering the pool.
(b) "Underwater radiography" means industrial radiography performed when the radiographic exposure device or the related equipment is beneath the surface of the water.

(c) "Unit dose" means a dosage prepared for medical use for administration to a patient or human research subject as a single dosage, without any further manipulation of the dosage after the dosage is initially prepared.

(d) "Unrefined and unprocessed ore" means ore in its natural form before any processing, including grinding, roasting, beneficiating, and refining. "Processing" shall not include sieving or the encapsulation of ore or preparation of samples for laboratory analysis.

(e) "Unrestricted area" means an area to which access is neither limited nor controlled by the licensee or registrant. For purposes of these regulations, "uncontrolled area" shall be considered an equivalent term.

(f) "Useful beam" means the part of the radiation that passes through a window, aperture, cone, or other collimating device.

28-35-135v. Definitions. As used in these regulations, each of the following terms shall have the meaning assigned in this regulation:

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

(b) "Very high radiation area" means an area that is accessible to individuals, in which radiation levels could result in an individual receiving an absorbed dose in excess of five Gy (500 rad) in one hour at one meter from a source of radiation or from any surface that the radiation penetrates.

(c) "Virtual source" means the point from which radiation appears to originate.

(d) "Visible area" means that portion of the input surface of the image receptor over which incident X-ray photons produce a visible image.

28-35-135w. Definitions. As used in these regulations, each of the following terms shall have the meaning assigned in this regulation: (a) "Waste" means any low-level radioactive waste that is acceptable for disposal in a land disposal facility. Low-level radioactive waste shall mean radioactive waste that meets both of the following conditions:

1. Is not classified as any of the following:
   A. High-level radioactive waste;
   B. spent nuclear fuel;
   C. "byproduct material," as defined in paragraphs (2), (3), and (4) in the definition of "byproduct material" in 10 CFR 20.1003, dated December 1, 2009;
   D. uranium or thorium tailings; and
   E. transuranic waste; and
2. is classified as low-level radioactive waste consistent with existing law and in accordance with paragraph (a)(1) by the nuclear regulatory commission.

(b) "Waste-handling licensee" means any person licensed to receive and store radioactive wastes before disposal, any person licensed to dispose of radioactive waste, or any person licensed to both receive and dispose of radioactive waste.

(c) "Wedge filter" means an added filter effecting continuous, progressive attenuation of all or part of the useful beam.

(d) "Week" means seven consecutive days, starting on Sunday.

(e) "Weighting factor (wT) for an organ or tissue (T)" means the proportion of the risk of stochastic effects resulting from irradiation of that organ or tissue to the total risk of stochastic effects when the whole body is irradiated uniformly. For calculating the effective dose equivalent, the values of wT shall be as follows:
(f) "Well bore" means a drilled hole in which wireline service operations and subsurface tracer studies are performed. (g) "Well logging" means the lowering and raising of measuring devices or tools that could contain sources of radiation into well bores or cavities for the purpose of obtaining information about the well or adjacent formations.

(h) "Wet-source-change irradiator" means an irradiator whose sources are replaced underwater.

(i) "Wet-source-storage irradiator" means an irradiator whose sources are stored underwater.

(j) "Whole body," for purposes of external exposure, means the head and trunk, including the male gonads, and shall include the arms above the elbow and the legs above the knee.

(k) "Wireline" means a cable containing one or more electrical conductors that is used to raise and lower logging tools in the well bore.

(l) "Wireline service operation" means any evaluation or mechanical service that is performed in the well bore using devices on a wireline.
(m) "Worker" means an individual, contractor, or subcontractor engaged in work that is performed under a license or registration, or both, issued by the department and that is controlled by a licensee or registrant, or both. This term shall not include a specific licensee or registrant.

(n) "Working level (WL)" means any combination of short-lived radon daughters in one liter of air that will result in the ultimate emission of 1.3E+5 MeV of potential alpha particle energy. The short-lived radon daughters are the following:

(1) For radon-222, the following:
   (A) Polonium-218;
   (B) lead-214;
   (C) bismuth-214; and
   (D) polonium-214; and

(2) for radon-220, the following:
   (A) Polonium-216;
   (B) lead-212;
   (C) bismuth-212; and
   (D) polonium-212.

(o) "Working-level month (WLM)" means an exposure to one working level for 170 hours.

(p) "Written directive" means a written order for a specific patient that is dated and signed by an authorized user before the administration of a radiopharmaceutical or radiation and that contains any of the following sets of information:

(1) For any administration of quantities greater than 1.11 megabecquerels (30 uCi) of sodium iodide I-125 or I-131, the radionuclide and dosage;

(2) for a therapeutic administration of a radiopharmaceutical other than sodium iodide I-125 or I-131, the radiopharmaceutical, dosage, and route of administration;

(3) for gamma stereotactic radiosurgery, the target coordinates, collimator size, plug pattern, and total dose;

(4) for teletherapy, the total dose, dose per fraction, treatment site, and overall treatment period;

(5) for high dose-rate remote afterloading brachytherapy, the radionuclide, treatment site, and total dose; or

(6) for all other brachytherapy, the following information:
(A) Before implantation, the radionuclide, number of sources, and source strengths; and
(B) after implantation but before completion of the procedure, the radionuclide, treatment site, and either the total source strength and exposure time or the total dose. (Authorized by K.S.A. 48-1607; implementing K.S.A. 48-1603 and 48-1607; effective Dec. 30, 2005; amended March 18, 2011.)

28-35-135x. Definitions. As used in these regulations, each of the following terms shall have the meaning assigned in this regulation: (a) "X-ray control" means a device that controls input power to the X-ray high-voltage generator or the X-ray tube, including timers, phototimers, automatic brightness stabilizers, and similar devices that control the technique factors of an X-ray exposure.

(b) "X-ray equipment" means an X-ray system or subsystem, or component of the system or subsystem, which may be mobile, stationary, or portable.

(c) "X-ray exposure control" means a device, switch, button, or other similar means by which an operator initiates or terminates the radiation exposure. The X-ray exposure control may include associated equipment including timers and backup timers.

(d) "X-ray field" means 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, as established by the beam-limiting device, is the locus of points at which the exposure rate is one-fourth of the maximum in the intersection.

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

(f) "X-ray system" means an assemblage of components for the controlled production of X-rays. The X-ray system shall include, at a minimum, an X-ray high-voltage generator, an X-ray control, a tube housing assembly, a beam-limiting device, and supporting structures. Additional components that function with the system shall be considered integral parts of the system.
(g) "X-ray table" means a patient-support device used during radiography and fluoroscopy. This term shall include any stretcher equipped with a radiolucent panel and any table equipped with a cassette tray or bucky, cassette tunnel, image intensifier, or spot-film device beneath the tabletop.

(h) "X-ray tube" means any electron tube that is designed for the conversion of electrical energy into X-ray energy. (Authorized by K.S.A. 48-1607; implementing K.S.A. 48-1603 and 48-1607; effective Dec. 30, 2005.)

28-35-135y. Definition. As used in these regulations, "year" shall have the meaning assigned in this regulation. "Year" means the period of time beginning in January and consisting of four consecutive quarters, as defined in K.A.R. 28-35-135q [p.35], that is used to determine compliance with the provisions of these regulations. Any licensee or registrant may change the starting date of the year used to determine compliance by the licensee or registrant if the change is made at the beginning of the year and if no day is omitted or duplicated in any consecutive year. (Authorized by K.S.A. 48-1607; implementing K.S.A. 48-1603 and 48-1607; effective Dec. 30, 2005.)


28-35-137. Records. Each licensee or registrant shall keep records showing the receipt, transfer, and disposal of all sources of radiation, and any other records specifically required by these regulations. (Authorized by and implementing K.S.A. 1984 Supp. 48-1607; effective Jan. 1, 1970; amended, T-85-43, Dec. 19, 1984; amended May 1, 1985.)

28-35-138. Inspections. (a) Each licensee or registrant shall afford, at all reasonable times, the secretary or the secretary's duly authorized representative the opportunity to inspect sources of radiation and the premises and installations in which such sources of radiation are used or stored.
(b) Each licensee or registrant, upon reasonable notice, shall make available, for inspection by the secretary or the secretary's duly authorized representative records maintained pursuant to these regulations. (Authorized by K.S.A. 1984 Supp. 48-1607; implementing K.S.A. 1984 Supp. 48-1607, 48-1609; effective Jan. 1, 1970; amended, T-85-43, Dec. 19, 1984; amended May 1, 1985.)

28-35-139. Testing and surveys. (a) Each licensee or registrant shall make, or cause to be made, those surveys that are necessary for the licensee or registrant to comply with these regulations.

(b) Each licensee or registrant shall perform, upon instructions from the department, or shall permit the department to perform, such reasonable tests as the department deems appropriate or necessary, including, but not limited to, tests of:

1) Sources of radiation;
2) installations in which sources of radiation are used or stored;
3) radiation detection and monitoring instruments; and
4) other equipment and devices employed during use or storage of licensed or registered sources of radiation. (Authorized by and implementing K.S.A. 1984 Supp. 48-1607; effective Jan. 1, 1970; amended, T-85-43, Dec. 19, 1984; amended May 1, 1985.)

28-35-140. Exemptions. (a) Carriers. Each common carrier, each contract carrier, each freight forwarder, and each U.S. postal service carrier that only transports or stores radioactive material in the regular course of carriage or storage shall be exempt from parts 3, 4, 6, 7, 10, 11, and 12 of these regulations and from K.A.R. 28-35-700 [p.380].

(b) U.S. department of energy contractors and U.S. nuclear regulatory commission contractors. Each U.S. department of energy contractor or subcontractor and each U.S. nuclear regulatory commission contractor or subcontractor operating in Kansas shall be exempt from these regulations to the extent that the contractor or subcontractor, under the contract, receives, possesses, uses, transfers, or acquires sources of radiation and if the contractor or subcontractor is included in one of the following categories:

1) Prime contractors performing work for the U.S. department of energy at sites owned or controlled by the U.S.
government, including the transportation of sources of radiation to or from these sites and the performance of contract services during temporary interruptions of transportation;

(2) prime contractors of the U.S. department of energy performing research in, or development, manufacture, storage, testing, or transportation of, atomic weapons or components of atomic weapons;

(3) prime contractors of the U.S. department of energy using or operating nuclear reactors or other nuclear devices in a U.S. government-owned vehicle or vessel; and

(4) any other prime contractor or subcontractor of the U.S. department of energy or the U.S. nuclear regulatory commission if the secretary determines that, under the terms of the contract or subcontract, there is adequate assurance that the work can be accomplished without undue risk to the public health and safety.


28-35-141. Additional requirements. At the time of registration, at the time of action upon application for license or amendment to the license, or upon inspection, the department shall specify any requirements or conditions of use, or both, that are necessary to ensure compliance with these regulations under the particular usage to which the licensee or registrant proposes to put the source of radiation. (Authorized by and implementing K.S.A. 1984 Supp. 48-1607; effective Jan. 1, 1970; amended, T-85-43, Dec. 19, 1984; amended May 1, 1985.)


28-35-144. Appendix B—Tests for special form licensed material.
(a) "Free Drop" means releasing material, without thrust, from a point 30 feet above a flat, essentially unyielding, horizontal surface, so that the material strikes the surface.

(b) "Percussion" means impacting material with the flat, circular end of a one inch diameter steel rod weighing three pounds, by releasing the steel rod a distance of forty inches above the surface of the material. The material shall be placed on a sheet of lead, of hardness number 3.5 to 4.5 on the Vickers scale, and not more than one inch thick, supported by a smooth, essentially unyielding surface.

(c) Heating: heating in air to a temperature of 1,475° F. and remaining at that temperature for a period of 10 minutes.

(d) Immersion: immersion for 24 hours in water at room temperature. The water shall be at pH 6—pH 8, with a maximum conductivity of 10 micromhos per centimeter. (Authorized by and implementing K.S.A. 1984 Supp. 48-1607; effective May 1, 1976; amended, T-85-43, Dec. 19, 1984; amended May 1, 1985.)

**28-35-144a.** (a) As used in these regulations, the quality factors for converting absorbed dose to dose equivalent are shown in table I.

<table>
<thead>
<tr>
<th>TYPE OF RADIATION</th>
<th>QUALITY FACTOR (Q)</th>
<th>ABSORBED DOSE EQUAL TO A UNIT DOSE EQUIVALENT*</th>
</tr>
</thead>
<tbody>
<tr>
<td>X, gamma, or beta radiation and high-speed electrons</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Alpha particles, multiple-charged particles, fission fragments and heavy particles of unknown charge</td>
<td>20</td>
<td>0.05</td>
</tr>
<tr>
<td>Neutrons of unknown energy</td>
<td>10</td>
<td>0.1</td>
</tr>
<tr>
<td>High-energy protons</td>
<td>10</td>
<td>0.1</td>
</tr>
</tbody>
</table>
*Absorbed dose in gray equal to 1 Sv or the absorbed dose in rad equal to 1 rem.

(b) If it is more convenient to measure the neutron fluence rate than to determine the neutron dose equivalent rate in sievert per hour or rem per hour, as provided in K.A.R. 28-35-144a [p.56] (a), 0.01 Sv (1 rem) of neutron radiation of unknown energies may, for purposes of these regulations, be assumed to result from a total fluence of 25 million neutrons per square centimeter incident upon the body. If sufficient information exists to estimate the approximate energy distribution of the neutrons, the licensee or registrant may use the fluence rate per unit dose equivalent or the appropriate Q value from table II to convert a measured tissue dose in gray or rad to dose equivalent in sievert or rem.

### TABLE II

**MEAN QUALITY FACTORS, Z, AND FLUENCE PER UNIT DOSE EQUIVALENT FOR MONOENERGETIC NEUTRONS**

<table>
<thead>
<tr>
<th>Neutron Energy (MeV)</th>
<th>Quality Factor* (Q)</th>
<th>Fluence per Unit Dose Equivalent$^b$ (neutrons cm$^{-2}$ rem$^{-1}$)</th>
<th>Fluence per Unit Dose Equivalent$^b$ (neutrons cm$^{-2}$ Sv$^{-1}$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5E-8 (thermal)</td>
<td>2</td>
<td>$980E+6$</td>
<td>$980E+8$</td>
</tr>
<tr>
<td>1E-7</td>
<td>2</td>
<td>$980E+6$</td>
<td>$980E+8$</td>
</tr>
<tr>
<td>1E-6</td>
<td>2</td>
<td>$810E+6$</td>
<td>$810E+8$</td>
</tr>
<tr>
<td>1E-5</td>
<td>2</td>
<td>$810E+6$</td>
<td>$810E+8$</td>
</tr>
<tr>
<td>1E-4</td>
<td>2</td>
<td>$840E+6$</td>
<td>$840E+8$</td>
</tr>
<tr>
<td>1E-3</td>
<td>2</td>
<td>$980E+6$</td>
<td>$980E+8$</td>
</tr>
<tr>
<td>1E-2</td>
<td>2.5</td>
<td>$1010E+6$</td>
<td>$1010E+8$</td>
</tr>
<tr>
<td>1E-1</td>
<td>7.5</td>
<td>$170E+6$</td>
<td>$170E+8$</td>
</tr>
<tr>
<td>5E-1</td>
<td>11</td>
<td>$39E+6$</td>
<td>$39E+8$</td>
</tr>
<tr>
<td>1</td>
<td>11</td>
<td>$27E+6$</td>
<td>$27E+8$</td>
</tr>
<tr>
<td>2.5</td>
<td>9</td>
<td>$29E+6$</td>
<td>$29E+8$</td>
</tr>
<tr>
<td>5</td>
<td>8</td>
<td>$23E+6$</td>
<td>$23E+8$</td>
</tr>
</tbody>
</table>
### 28-35-145 Radiation Control Program

<table>
<thead>
<tr>
<th>Neutron Energy (MeV)</th>
<th>Quality Factor* (Q)</th>
<th>Fluence per Unit Dose Equivalent(^{b}) (neutrons cm(^{-2}) rem(^{-1}))</th>
<th>Fluence per Unit Dose Equivalent(^{b}) (neutrons cm(^{-2}) Sv(^{-1}))</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>7</td>
<td>24E+6</td>
<td>24E+8</td>
</tr>
<tr>
<td>10</td>
<td>6.5</td>
<td>24E+6</td>
<td>24E+8</td>
</tr>
<tr>
<td>14</td>
<td>7.5</td>
<td>17E+6</td>
<td>17E+8</td>
</tr>
<tr>
<td>20</td>
<td>8</td>
<td>16E+6</td>
<td>16E+8</td>
</tr>
<tr>
<td>40</td>
<td>7</td>
<td>14E+6</td>
<td>14E+8</td>
</tr>
<tr>
<td>60</td>
<td>5.5</td>
<td>16E+6</td>
<td>16E+8</td>
</tr>
<tr>
<td>1E+2</td>
<td>4</td>
<td>20E+6</td>
<td>20E+8</td>
</tr>
<tr>
<td>2E+2</td>
<td>3.5</td>
<td>19E+6</td>
<td>19E+8</td>
</tr>
<tr>
<td>3E+2</td>
<td>3.5</td>
<td>16E+6</td>
<td>16E+8</td>
</tr>
<tr>
<td>4E+2</td>
<td>3.5</td>
<td>14E+6</td>
<td>14E+8</td>
</tr>
</tbody>
</table>

\(^{a}\) Value of quality factor (Q) at the point where the dose of equivalent is maximum in a 30-centimeter diameter cylinder tissue-equivalent phantom.

\(^{b}\) Monoenergetic neutrons incident normally on a 30-centimeter diameter cylinder tissue-equivalent phantom.


#### 28-35-145. Initial license and registration fees.

(a) Each person required under part 3 of these regulations to obtain a license for the use of radioactive, by-product, source, or special nuclear materials shall submit to the department an application for a license and the applicable nonrefundable license fees specified in K.A.R. 28-35-147a [p.61].

(b) Each person required under part 2 of these regulations to register a radiation machine shall submit to the department a registration form and the applicable nonrefundable registration fees specified in K.A.R. 28-35-147a [p.61]. The fee for each initial registration made after March 31 shall be prorated by the department based on the number of calendar quarters remaining in the annual registration period.
(c) Each person paying an initial license fee or registration fee specified in this regulation shall make the payment by check, draft, credit card, or money order payable to the Kansas department of health and environment. (Authorized by and implementing K.S.A. 48-1606, as amended by 2004 SB 396, § 1, and K.S.A. 48-1607; effective May 1, 1987; amended Oct. 8, 2004.)

28-35-146. Annual license and registration fees. (a) Payment method. Each licensee or registrant shall make annual fee payments by check, draft, credit card, or money order payable to the Kansas department of health and environment.

(b) Annual license fees. Each licensee shall submit to the department the applicable nonrefundable annual license fees specified in K.A.R. 28-35-147a [p.61] on or before the last business day of the month corresponding to the anniversary date of the license.

(c) Annual registration fees. Each registrant shall submit to the department a registration form and the applicable nonrefundable annual registration fees specified in K.A.R. 28-35-147a [p.61] on or before March 1. If March 1 falls on a Saturday, Sunday, or holiday, then the fee payment shall be due on or before the next business day following March 1. (Authorized by and implementing K.S.A. 48-1606, as amended by 2004 SB 396, § 1 and K.S.A. 48-1607; effective May 1, 1987; amended May 1, 1988; amended Oct. 8, 2004.)

28-35-146a. Determination of hourly rate and full cost; fee payments. (a) Hourly rate. If the department charges a fee to provide the following and there is no established fee category in K.A.R. 28-35-147a [p.61], the hourly rate charged shall be $79.00:

(1) Any radiation protection service that the department provides to a nonlicensee or nonregistrant; and

(2) any radiation control program activity.

(b) Full cost. For each full-cost category specified in K.A.R. 28-35-147a(d)(1) [p.61], the initial application fee, annual fee, and amendment fees shall be paid in accordance with the following requirements:
(1) Each applicant shall pay a nonrefundable initial
application fee of $500,000 to cover the actual costs incurred by the
department to review the initial license application.

(A) If the initial application fee exceeds the actual cost of
reviewing the initial application, the overage shall be credited to the
annual fee for the following fiscal year.

(B) If the initial application fee is less than the actual cost of
reviewing the initial application, the difference shall be due within
30 days of receipt of written notification from the secretary. No
license shall be issued until all required fees are paid in full.

(2) Each licensee shall pay a nonrefundable annual fee to
cover the actual cost incurred by the department to service the
license and any amendments to the license.

(A) If the annual fee exceeds the actual cost of servicing the
license and any amendments, the overage shall be credited to the
annual fee for the following fiscal year.

(B) If the annual fee paid for any fiscal year is less than the
actual cost to the department, the difference shall be due within 30
days of receipt of written notification from the secretary.

(c) Fee payments. Each fee payment specified in subsection
(b) shall be made in accordance with the following requirements:

(1) Each initial application for which a license fee is required
shall be accompanied by the full amount of the fee. Any application
for which a fee is not received may be returned to the applicant.

(2) On or before June 1 of the fiscal year preceding the fiscal
year for which the annual fee applies, the licensee shall be notified
by the secretary of the amount of the annual fee.

(3) Each fee payment shall be submitted within 30 days of
receipt of written notification from the secretary of the annual fee or
by July 1, whichever date is earlier.

(4) Each fee payment shall be made by check, draft, money
order, or electronic fund transfer payable to the department.

(Authorized by and implementing K.S.A. 2018 Supp. 48-1606;
effective Oct. 8, 2004; amended Feb. 22, 2019.)

28-35-147. (Authorized by and implementing K.S.A. 1990
Supp. 48-1606; effective May 1, 1987; amended May 1, 1988;
amended March 16, 1992; revoked Oct. 8, 2004.)
28-35-147a. Schedule of fees. Each fee for an initial license application or initial registration shall be equal to the sum of the annual fees for all applicable categories. Each annual fee for a license or registration shall be equal to the sum of the annual fees for all applicable categories. The following fees shall be paid as specified in K.A.R. 28-35-145 [p.58] and 28-35-146 [p.59]:

(a) Special nuclear material.

(1) Licenses for possession and use of special nuclear material in sealed sources contained in devices used in industrial measuring systems.

Annual fee $950.00

(2) Any licenses not otherwise specified in this regulation for possession and use of special nuclear material, except licenses authorizing special nuclear material in unsealed form in combination that would constitute a critical mass.

Annual fee $2,250.00

(b) Source material.

(1) Licenses that authorize only the possession, use, or installation of source material for shielding.

Annual fee $365.00

(2) All other source material licenses not otherwise specified in this regulation.

Annual fee $5,700.00

(c) Radioactive material or by-product material.

(1) Licenses of broad scope for possession and use of radioactive material or by-product material issued for processing or manufacturing items containing radioactive material or by-product material for commercial distribution.

Annual fee $10,900.00

(2) Other licenses for possession and use of radioactive material or by-product material issued for processing or manufacturing items containing radioactive material or by-product material for commercial distribution.

Annual fee $3,300.00

(3) Licenses authorizing the processing or manufacturing and the distribution or redistribution of radiopharmaceuticals, generators, reagent kits, sources, or devices containing radioactive material or by-product material. This category shall include the
possession and use of source material for shielding when included on the same license.

Annual fee $5,450.00

(4) Licenses and approvals authorizing distribution or redistribution of radiopharmaceuticals, generators, reagent kits, sources, or devices not involving processing of radioactive material or by-product material. This category shall include the possession and use of source material for shielding when included on the same license.

Annual fee $2,350.00

(5) Licenses for possession and use of radioactive material or by-product material in sealed sources for irradiation of items in self-shielded units in which the source is not removed from its shield.

Annual fee $1,800.00

(6) Licenses for possession and use of less than 10,000 curies of radioactive material or by-product material in sealed sources for irradiation of items in which the source is exposed for irradiation purposes. This category shall include underwater irradiators for irradiation of items in which the source is not exposed for irradiation purposes.

Annual fee $3,300.00

(7) Licenses for possession and use of 10,000 curies or more of radioactive material or by-product material in sealed sources for irradiation of items in which the source is exposed for irradiation purposes. This category shall include underwater irradiators for irradiation of items in which the source is not exposed for irradiation purposes.

Annual fee $12,050.00

(8) Licenses issued to distribute items containing radioactive material or by-product material that require device review to persons exempt from licensing, except specific licenses authorizing redistribution of items that have been authorized for distribution to persons exempt from licensing.

Annual fee $3,000.00

(9) Licenses issued to distribute items containing radioactive material or by-product material or quantities of radioactive material or by-product material that do not require device review to persons exempt from licensing, except for specific licenses authorizing
redistribution of items that have been authorized for distribution to persons exempt from licensing.

Annual fee $3,050.00

(10) Licenses issued to distribute items containing radioactive material or by-product material that require a safety review of the sealed source or device to any person with a general license, except specific licenses authorizing redistribution of items that have been authorized for distribution to any person with a general license.

Annual fee $1,100.00

(11) Licenses issued to distribute items containing radioactive material or by-product material or quantities of radioactive material or by-product material that do not require a safety review of the sealed source or device to any person with a general license, except specific licenses authorizing redistribution of items that have been authorized for distribution to any person with a general license.

Annual fee $700.00

(12) Licenses of broad scope for possession and use of radioactive material or by-product material issued for research and development that do not authorize commercial distribution.

Annual fee $5,900.00

(13) Other licenses for possession and use of radioactive material or by-product material issued for research and development that do not authorize commercial distribution.

Annual fee $2,800.00

(14) Licenses that authorize services for other licensees, except the following:

(A) Licenses that authorize only calibration or leak-testing services, or both, shall be subject to the fee specified in paragraph (c)(16).

(B) Licenses that authorize waste disposal services shall be subject to the applicable fees specified in subsection (d).

Annual fee $3,050.00

(15) Licenses for possession and use of radioactive material or by-product material for industrial radiography. This category shall include the possession and use of source material for shielding when authorized on the same license.

Annual fee $6,100.00
(16) All other specific radioactive material or by-product material licenses not otherwise specified in this regulation.
   Annual fee $1,250.00
(17) Registration of general licenses for devices or sources.
   Annual fee $225.00
(d) Waste disposal and processing.
   (1) Licenses authorizing the possession and use of radioactive material, including by-product material, source material, and special nuclear material, for a commercial, low-level radioactive waste disposal facility.
      Annual fee Full cost, as specified in K.A.R. 28-35-146a [p.59]
      (A) Amendment to license concerning safety and environmental issues.
         Amendment fee Full cost, as specified in K.A.R. 28-35-146a [p.59]
      (B) Amendment to license concerning administrative questions with no safety or environmental issues.
         Amendment fee Full cost, as specified in K.A.R. 28-35-146a [p.59]
   (2) Licenses specifically authorizing the receipt of radioactive material, including by-product material, source material, and special nuclear material, from other persons for the purpose of packaging or repackaging the radioactive material. The licensee shall dispose of the radioactive material by transfer to another person authorized to receive or dispose of the radioactive material.
      Annual fee $5,150.00
   (3) Licenses specifically authorizing the receipt of prepackaged radioactive material, including by-product material, source material, and special nuclear material, from other persons. The licensee shall dispose of the radioactive material by transfer to another person authorized to receive or dispose of the radioactive material.
      Annual fee $3,700.00
(e) Well logging.
   (1) Licenses for possession and use of radioactive material or by-product material, source material, or special nuclear material for well logging, well surveys, and tracer studies other than field flooding tracer studies.
      Annual fee $2,350.00
(2) Licenses for possession and use of radioactive material or by-product material for field flooding tracer studies.
   Annual fee $2,350.00

(f) Nuclear laundries. Licenses for commercial collection and laundry of items contaminated with radioactive material or by-product material, source material, or special nuclear material.
   Annual fee $11,550.00

(g) Medical licenses.
   (1) Licenses issued for human use of radioactive material or by-product material, source material, or special nuclear material in sealed sources contained in teletherapy devices. This category shall include the possession and use of source material for shielding when authorized on the same license.
      Annual fee $5,500.00
   (2) Licenses of broad scope issued to medical institutions or two or more physicians authorizing research and development, including human use of radioactive material or by-product material, except licenses for radioactive material or by-product material, source material, or special nuclear material in sealed sources contained in teletherapy devices. This category shall include the possession and use of source material for shielding when authorized on the same license. Separate annual fees shall not be assessed for pacemaker licenses issued to medical institutions that also hold nuclear medicine licenses under categories in this paragraph or paragraph (g)(3).
      Annual fee $12,350.00
   (3) Other licenses issued for human use of radioactive material or by-product material, source material, or special nuclear material, except licenses for radioactive material or by-product material, source material, or special nuclear material in sealed sources contained in teletherapy devices. This category shall include the possession and use of source material for shielding when authorized on the same license. Separate annual fees shall not be assessed for pacemaker licenses issued to medical institutions that also hold nuclear medicine licenses under categories in this paragraph or paragraph (g)(2).
      Annual fee $2,300.00
(h) Civil defense. Licenses for possession and use of radioactive material or by-product material, source material, or special nuclear material for civil defense activities.
   Annual fee $650.00
   
   (i) Device, product, or sealed source safety evaluation.
   (1) Safety evaluation review of each device or product containing radioactive material or by-product material, source material, or special nuclear material, except any reactor fuel device, for commercial distribution. This fee shall apply to each device or product.
   Fee $3,500.00
   (2) Safety evaluation review of each device or product containing radioactive material or by-product material, source material, or special nuclear material manufactured in accordance with the unique specifications of, and for use by, a single applicant, except any reactor fuel device. This fee shall apply to each device or product.
   Fee $3,500.00
   (3) Safety evaluation of each sealed source containing radioactive material or by-product material, source material, or special nuclear material, except reactor fuel, for commercial distribution. This fee shall apply to each sealed source.
   Fee $1,100.00
   (4) Safety evaluation of each sealed source containing radioactive material or by-product material, source material, or special nuclear material manufactured in accordance with the unique specifications of, and for use by, a single applicant. This fee shall apply to each sealed source.
   Fee $365.00

   (j) Reciprocity.
   (1) Licensees who conduct activities under a reciprocal agreement.
   Annual fee $750.00
   (2) Registrants who conduct activities under a reciprocal agreement.
   Annual fee $200.00

   (k) X-ray machines.
   (1) Base registration fee per facility.
   Annual fee $200.00
(2) Registration fee for each x-ray tube at a facility. This fee shall be in addition to the base registration fee.
   Annual fee per x-ray tube $50.00
(l) Particle accelerators.
   Annual fee $300.00
(m) Noncontiguous sites.
   (1) An additional annual fee of 50 percent of the annual fee specified in this regulation shall be assessed for each noncontiguous site where radioactive material is stored or used under the same license, per category.
   (2) "Noncontiguous site" shall have the meaning specified in K.S.A. 2018 Supp. 48-1606, and amendments thereto. (Authorized by and implementing K.S.A. 2018 Supp. 48-1606; effective Oct. 8, 2004; amended March 29, 2013; amended Feb. 22, 2019.)

28-35-148. Deliberate misconduct. (a) This regulation shall apply to the following:
   (1) Each licensee;
   (2) each registrant;
   (3) each applicant for a license;
   (4) each employee of a licensee, registrant, or applicant; and
   (5) each contractor, including each supplier, consultant, subcontractor, and employee of a contractor or subcontractor of any licensee, registrant, or applicant for a license.
   (b) Each individual specified in subsection (a) who knowingly provides to any licensee, applicant, registrant, contractor, or subcontractor any components, equipment, materials, or other goods or services that relate to a licensee's, registrant's, or applicant's activities in this article shall be prohibited from engaging in deliberate misconduct, as defined in K.A.R. 28-35-135d [p.12].
   (c) Any person who violates the requirements of this regulation may be subject to enforcement action pursuant to K.S.A. 48-1613, and amendments thereto. (Authorized by and implementing K.S.A. 48-1607 and 48-1613; effective Dec. 30, 2005.)

Part 2. Radiation Producing Machines
28-35-152. Persons registered. Any person possessing a registrable item shall register with the department in accordance

**28-35-153. Initial registration.** Any person who is not registered and who acquires possession of a registrable item shall register with the department, within 30 days of the date of acquiring the item. (Authorized by and implementing K.S.A. 1984 Supp. 48-1607; effective Jan. 1, 1970; amended, T-85-43, Dec. 19, 1984; amended May 1, 1985.)

**28-35-154. Renewal of registration.** Each registrant who possesses a radiation-producing device shall reregister with the department annually. This registration shall be submitted on or before March 1 of each year. (Authorized by and implementing K.S.A. 48-1607; effective Jan. 1, 1970; amended, T-85-43, Dec. 19, 1984; amended May 1, 1985; amended Dec. 30, 2005.)

**28-35-155. Registration form.** Registration shall be made upon forms devised and furnished by the department. Each registrant shall provide all the information called for by the form and any additional information requested by the department. (Authorized by and implementing K.S.A. 1984 Supp. 48-1607; effective Jan. 1, 1970; amended, T-85-43, Dec. 19, 1984; amended May 1, 1985.)


**28-35-157. Special registration.** If the reporting of each installation, or other information called for, is impractical, the secretary, upon the written request of a person and upon a finding that the public health and safety would not be adversely affected, may approve registration in such special form as the secretary may prescribe. (Authorized by and implementing K.S.A. 1984 Supp. 48-
28-35-158. Report of change. If a change is made on any x-ray equipment or other device producing radiation, or to any installation, so that information on file with the department is no longer accurate, the registrant shall notify the department, in writing, of the change, within 30 days of the date the change was made. (Authorized by and implementing K.S.A. 1984 Supp. 48-1607; effective Jan. 1, 1970; amended, T-85-43, Dec. 19, 1984; amended May 1, 1985.)

28-35-159. Registration shall not imply approval. A person shall not refer, in any form of advertisement, to the fact a registrable item is registered with the department, or state or imply that any installation registered with the department is approved by the department. (Authorized by and implementing K.S.A. 1984 Supp. 48-1607; effective Jan. 1, 1970; amended, T-85-43, Dec. 19, 1984; amended May 1, 1985.)

28-35-160. Vendor notification. (a) Each distributor, retailer, or other person who sells, leases, transfers, or lends any registrable item or items shall notify the department, at 90-day intervals, of the following:

1. The names and addresses of all persons who have received the item or items;
2. the name of the manufacturer and the model number of the item or items transferred; and
3. the date on which the registrable item or items were transferred.

(b) No person shall make, sell, lease, transfer, lend, assemble, or install radiation machines or the supplies used in connection with these machines unless the machines and supplies, when properly placed in operation and used, meet the requirements of these regulations. (Authorized by and implementing K.S.A. 48-1607; effective Jan. 1, 1970; amended, T-85-43, Dec. 19, 1984; amended May 1, 1985; amended Dec. 30, 2005.)
28-35-161. Discontinuance of use. If a registrant ceases to use a registrable item or items, for any reason, the registrant or the duly authorized representative of the registrant's estate shall give written notice to the department of the cessation of use. The notice shall be provided within 30 days of the date that the registrant ceases to use the registrable item or items, and shall state the date on which use of the item or items was discontinued and the manner in which the registrable item or items were disposed. (Authorized by and implementing K.S.A. 1984 Supp. 48-1607; effective Jan. 1, 1970; amended, T-85-43, Dec. 19, 1984; amended May 1, 1985.)

28-35-162. Exclusion from registration. The following equipment shall not be required to be registered: (a) Electronic equipment that produces radiation incidental to its operation for other purposes, if the dose equivalent rate averaged over an area of 10 square centimeters does not exceed five uSv (0.5 millirem) per hour at five centimeters from any accessible surface of the equipment.

(b) radiation-producing equipment that is in transit or is in storage incident to transit; and


28-35-163. Excluded possessors. (a) Except as provided in subsection (b), a common carrier or contract carrier operating within this state who is in possession of a registrable item or items shall be exempt from the provisions of these regulations, if the carrier possesses the registrable item or items for another person, solely for the purpose of transporting or storing the item or items.


28-35-164. Temporary use or storage of registrable items. Any person desiring to bring a registrable item into this state
for temporary use or storage shall give written notice to the department before bringing the item into this state. The notice shall be given to the department at least five days before the item is to be brought into this state and shall include the type and energy of the radiation source, the nature and scope of the use or storage, the proposed duration of use or storage, and the exact location where the radiation source is to be used or stored. If, in a specific case, the five day period would impose an undue hardship on the person, the person, upon application by letter or telegram to the department, may obtain permission to proceed at an earlier date.

In addition, the person shall:

(a) Comply with all applicable regulations for the department; and

(b) supply the department with such other information as it may request.

If a registrable item is kept in the state for a total of 30 days, in a period of 12 consecutive months, it shall be considered to be permanently located in the state and shall be subject to the registration provision of these regulations. (Authorized by and implementing K.S.A. 1984 Supp. 48-1607; effective Jan. 1, 1970; amended, T-85-43, Dec. 19, 1984; amended May 1, 1985.)

28-35-165. Disposal of registered items. Whenever any person disposes of a registrable item, or items, by any method, the person, or in the event of the person's death, the representative of the person's estate, shall give written notice to the department of the disposal within 30 days. The notice shall include the date of disposal, the method of disposal, and, if transferred to another person, the name and address of the recipient. (Authorized by and implementing K.S.A. 1984 Supp. 48-1607; effective Jan. 1, 1970; amended, T-85-43, Dec. 19, 1984; amended May 1, 1985.)

28-35-166. Shoe fitting, fluoroscopic machines; prohibition of. No person shall install, operate or maintain any device or machine within the state of Kansas which uses fluoroscopic, X-ray or radiation principles for the purpose of fitting shoes. (Authorized by and implementing K.S.A. 1984 Supp. 48-1607; effective Jan. 1, 1970; amended, T-85-43, Dec. 19, 1984; amended May 1, 1985.)
28-35-167. **Shielding plan for radiation-producing devices.** (a) Before construction, the floor plan or plans, shielding specifications, and equipment arrangement of all new installations, or modifications of existing installations, utilizing ionizing radiation machines shall be submitted to the department for review and consideration for approval, with the information specified in K.A.R. 28-35-168 [p.73] and K.A.R. 28-35-169 [p.74] of this part.

(b) If the applicant is not a qualified expert, then the applicant may be required to utilize the services of a qualified expert to determine the shielding specifications before the secretary's review and consideration for approval of the shielding plan.

(c) The approval of the shielding specifications shall not preclude the requirement of additional modifications if a subsequent analysis of operating conditions indicates the possibility that an individual could receive a dose in excess of the limits prescribed in K.A.R. 28-35-212a [p.192] and K.A.R. 28-35-214a [p.206].

(d) After installation of each radiation machine, the registrant shall maintain the following records for inspection by the department:

1. The maximum rated technique factors of the machine;
2. A scale drawing of the room in which the stationary radiation machine system is located. This drawing shall indicate the use of areas adjacent to the room and an estimation of the extent of occupancy by an individual in these areas. The drawing shall include either of the following:
   1. The results of a survey for radiation levels present at the operator's position and at points surveyed outside the room, and the specific test conditions used; or
   2. The type and thickness of materials, or the lead equivalency, of each protective barrier.

(e) A qualified expert, who shall be approved by the department, shall be consulted in the design of each particle accelerator installation and shall be called upon to perform a radiation survey when the accelerator is first capable of producing radiation.

(f) Each particle accelerator installation shall be provided with any primary or secondary barriers, or both, that are necessary to ensure compliance with the following:

1. K.A.R. 28-35-212a [p.192];
(2) K.A.R. 28-35-212c [p.196];
(3) K.A.R. 28-35-212d [p.196];
(4) K.A.R. 28-35-212f [p.200];
(5) K.A.R. 28-35-212g [p.202];
(6) K.A.R. 28-35-213a [p.205];
(7) K.A.R. 28-35-214a [p.206]; and

28-35-168. Information on radiation shielding required for plan reviews. Each registrant shall submit the following information as specified in K.A.R. 28-35-167 [p.72]:
   (a) (1) Each plan showing, at a minimum, all of the following:
      (A) The normal location of the system's radiation port;
      (B) the port's travel and traverse limits;
      (C) the general direction or directions of the useful beam;
      (D) the locations of any windows and doors and any other openings;
      (E) the location of the operator's booth; and
      (F) the location of the control panel;
   (2) the type and thickness of materials, or the lead equivalency, of all walls, doors, partitions, floors, and ceilings of each room;
   (3) the dimensions of each room;
   (4) the type of occupancy of all adjacent areas, inclusive of the space above and below each room. If there is an exterior wall, the distance to the closest area or areas where individuals are likely to be present shall be shown;
   (5) the make and model of the equipment, the maximum technique factors, and the energy waveform; and
   (6) each type of examination or treatment, or both, that will be performed with the equipment;
   (b) information on the anticipated workload of the system or systems in mA-minutes per week; and
   (c) a report showing all basic assumptions used in the development of the shielding specifications. (Authorized by and implementing K.S.A. 48-1607; effective Dec. 30, 2005.)
28-35-169. Design requirements for an operator's booth.

(a) Space requirements.
   (1) Each operator shall be allotted adequate room to operate the unit effectively.
   (2) In determining whether the allotted space is adequate, any encumbrance by the control panel, overhang, cables, or other similar encroachments shall be evaluated.
   (3) The booth shall be located or constructed so that unattenuated direct scattered radiation originating on the examination table or at the wall cassette cannot reach the operator's station in the booth.

(b) Structural requirements. Shielding shall be provided to meet the requirements of K.A.R. 28-35-211a [p.191] through K.A.R. 28-35-234a [p.249] of these regulations.

(c) Control placement. The control for the system shall be fixed within the booth.
   (1) The operation of the radiation-producing devices shall be possible only from within the booth.
   (2) The location of the control shall allow the operator to use the majority of the available viewing systems.

(d) Viewing system requirements.
   (1) Each booth shall have at least one viewing device positioned so that both of the following conditions are met:
      (A) The operator can view the patient during any exposure.
      (B) The operator can have full view of any occupant of the room and anyone who enters the room. If any door allowing access to the room cannot be seen from the booth, that door shall have an interlock control that prevents exposure if the door is not closed.
   (2) If the viewing system is a window, the window shall have the same lead equivalence as that required for the booth's wall in which the window is mounted.
   (3) If the viewing system is by mirrors, each mirror shall be positioned so that the requirements of K.A.R. 28-35-254(d)(1) [p.289] are met.
   (4) If the viewing system utilizes a camera, both of the following requirements shall be met:
      (A) The camera shall be positioned so that the requirements of K.A.R. 28-35-254(d)(1) [p.289] are met.
(B) An alternate viewing system shall be provided as a backup for the primary system. (Authorized by and implementing K.S.A. 48-1607; effective Dec. 30, 2005.)

**Part 3. Licensing of Sources of Radiation**


28-35-175a. Persons licensed. (a) A licensed person shall not manufacture, produce, receive, use, possess, acquire, own, transfer, or dispose of radioactive material, except as authorized in a specific or general license issued pursuant to these regulations. Each manufacturer, producer, or processor of any equipment, device, commodity, or other product containing source or "by-product material," as defined in 10 CFR 20.1003, dated December 1, 2009, for which subsequent receipt, use, possession, acquisition, ownership, transfer, and disposal by any other person is exempted from these regulations shall obtain authority to transfer possession or control to the other person from the nuclear regulatory commission.(b) In addition to the requirements of this part, each licensee shall be subject to the requirements of part 1, part 4, and part 10 of these regulations. In addition to being subject to part 1, part 4, and part 10, specific licensees shall be subject to all of the following requirements:(1) Licensees using radioactive material in the healing arts shall be subject to the requirements of part 6.(2) Licensees using radioactive material in industrial radiography shall be subject to the requirements of part 7.(3) Licensees using radioactive material in wireline and subsurface tracer studies shall be subject to the requirements of part 11 of these regulations. (Authorized by and implementing K.S.A. 48-1607; effective, T-86-37, Dec. 11, 1985; effective May 1, 1986; amended Dec. 30, 2005; amended March 18, 2011.)

28-35-176a. **Types of licenses.** Licenses for radioactive materials shall be either of the following types:

(a) Each general license shall be effective without the filing of an application with the department or the issuance of a licensing document to a particular person, although the filing of a certification with the department may be a requirement of the license. Each general licensee shall be subject to all other applicable portions of these regulations and any limitations of the general license. Any licensee may be required by the secretary to register a general license to protect public health and safety and the environment.

(b) Each specific license shall require the submission of an application to the department and the issuance of a licensing document by the department. Each specific licensee shall be subject to all applicable portions of these regulations as well as any limitations specified in the licensing document. (Authorized by and implementing K.S.A. 48-1607; effective, T-86-37, Dec. 11, 1985; effective May 1, 1986; amended Dec. 30, 2005.)


28-35-177a. **General licenses; source material.** (a) A general license is hereby issued authorizing commercial and industrial firms, research, educational, and medical institutions, and federal, state, and local government agencies to receive, possess, use, and transfer uranium and thorium, in their natural isotopic concentrations and in the form of depleted uranium, for research, development, educational, commercial, or operational purposes in any of the following forms and quantities:

(1) Uranium and thorium in the following quantities and forms:

(A) Not more than 1.5 kg (3.3 lb) of uranium and thorium in dispersible forms, including gases, liquids, and powders, at any one time. All material processed by the general licensee that alters the chemical or physical form of the material containing source material shall be accounted for as a dispersible form. A person authorized to possess, use, and transfer source material under this paragraph shall not receive more than a total of 7 kg (15.4 lb) of uranium and thorium in any one calendar year; and
(B) not more than 7 kg (15.4 lb) of uranium and thorium at any one time. A person authorized to possess, use, and transfer source material under this paragraph shall not receive more than 70 kg (154 lb) of uranium and thorium in any one calendar year. A person shall not alter the chemical or physical form of the source material possessed under this paragraph unless the source material is accounted for under the limits of paragraph (a)(1);

(2) not more than 7 kg (15.4 lb) of uranium, removed during the treatment of drinking water, at any one time. A person shall not remove more than 70 kg (154 lb) of uranium from drinking water during a calendar year under this paragraph; or

(3) not more than 7 kg (15.4 lb) of uranium and thorium at laboratories for the purpose of determining the concentration of uranium and thorium contained within the material being analyzed at any one time. A person authorized to possess, use, and transfer source material under this paragraph shall not receive more than 70 kg (154 lb) of source material in any one calendar year.

(b)(1) Each person who receives, possesses, uses, or transfers source material in accordance with the general license in subsection (a) shall be prohibited from the following:

(A) Administering source material, or the radiation from the source material, either externally or internally, to human beings except as authorized by a specific license issued by the department;

(B) abandoning the source material. Source material may be disposed of as follows:

(i) A cumulative total of 0.5 kg (1.1 lb) of source material in a solid, nondispersible form may be transferred each calendar year by a person authorized to receive, possess, use, and transfer source material under the general license to persons receiving the material for permanent disposal. The recipient of source material transferred under this paragraph shall be exempt from the requirements to obtain a license under part 3 of these regulations to the extent that the source material is permanently disposed of. This exemption shall not apply to any person who is in possession of source material under a specific license issued by the department; or

(ii) source material may be disposed in accordance with K.A.R. 28-35-190a [p.148]; and
(C) exporting the source material to another country except in accordance with a license issued by the nuclear regulatory commission (NRC).

(2) Each person specified in paragraph (b)(1) shall respond to each written request from the department to provide information relating to the general license within 30 calendar days of the date of the request or other time specified in the request. If the person cannot provide the requested information within the required time, the person shall, within the same time period, request a longer period to supply the information by providing the department with a written justification for the request.

(c) Each person who receives, possesses, uses, or transfers source material in accordance with subsection (a) shall minimize contamination of the facility and the environment. When activities involving source material are permanently ceased at any site, if evidence of significant contamination is identified, the general licensee shall notify the department about the contamination and may consult with the department regarding the appropriateness of sampling and restoration activities to ensure that any contamination or residual source material remaining at the site where source material was used under this general license is not likely to result in exposures that exceed the limits in these regulations.

(d) Each person who receives, possesses, uses, or transfers source material in accordance with the general license granted in subsection (a) shall be exempt from parts 4 and 10 of these regulations to the extent that the receipt, possession, use, and transfer are within the terms of this general license, except that the person shall meet the requirements of paragraph (b)(1)(B) and subsection (c). This exemption shall not apply to any person who also holds a specific license issued by the department.

(e) No person shall initially transfer or distribute source material to persons generally licensed under paragraph (a)(1) or (2) or equivalent regulations of an agreement state, unless authorized by a specific license issued by the NRC or equivalent provisions of an agreement state. This subsection shall not apply to analytical laboratories returning any processed sample to the client who initially provided the sample. (Authorized by and implementing K.S.A. 48-1607; effective, T-86-37, Dec. 11, 1985; effective May 1, 1986; amended Dec. 30, 2005; amended July 27, 2007; amended May 4, 2018.)

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28-35-178a. General license; certain ionization devices. (a) Each commercial and industrial firm, research, educational, and medical institution, individual in the conduct of the individual's business, and federal, state, or local government agency shall be deemed to have been issued a general license to acquire, receive, possess, use, or transfer radioactive material incorporated in any device or equipment as described in this subsection, if the device or equipment is manufactured, tested, and labeled by a manufacturer in accordance with the specifications of a specific license issued to the manufacturer by the secretary, the U.S. nuclear regulatory commission, or an agreement state. This general license shall apply to the following:

(1) Static elimination devices that are designed for ionization of air and that contain, as a sealed source or sources, radioactive material containing a total of not more than 500 microcuries of polonium-210 per device; and

(2) ion-generating tubes that are designed for ionization of air and that contain, as a sealed source or sources, radioactive material consisting of a total of not more than 500 microcuries of polonium-210 per device or a total of not more than 50 millicuries of hydrogen-3 (tritium) per device.

(b) The general license specified in subsection (a) shall be subject to the following regulations:

(1) K.A.R. 28-35-137 [p.53] through 28-35-139 [p.54];
(2) K.A.R. 28-35-192b [p.153];
(3) K.A.R. 28-35-184a [p.141];
(4) K.A.R. 28-35-190a [p.148];
(5) K.A.R. 28-35-191a [p.149];
(6) K.A.R. 28-35-196a [p.162]; and
(7) all of parts 4 and 10 of these regulations. (Authorized by and implementing K.S.A. 48-1607; effective, T-86-37, Dec. 11, 1985; effective May 1, 1986; amended Dec. 30, 2005; amended July 27, 2007.)
28-35-178b. General license; certain detecting, measuring, gauging, or controlling devices and certain devices for producing light or an ionized atmosphere. (a)(1) Subject to the provisions of subsections (b) and (c), each commercial and industrial firm, research, educational, and medical institution, individual in the conduct of the individual's business, and federal, state, or local government agency shall be deemed to have been issued a general license to acquire, receive, possess, use, or transfer radioactive material that is contained in any device designed, manufactured, and used for one or more of the following purposes:

(A) Detecting, measuring, gauging, or controlling thickness, density, level interface location, radiation leakage, or qualitative or quantitative chemical composition; or

(B) producing light or an ionized atmosphere.

(2) The general license specified in paragraph (1) of this subsection shall apply only to radioactive material contained in any device that has been manufactured and labeled by a manufacturer in accordance with the specifications of a specific license issued to that manufacturer by the secretary, the nuclear regulatory commission, or an agreement state.

(3) The general license specified in paragraph (1) of this subsection shall not apply to radioactive material in any device containing at least 370 MBq (10 mCi) of cesium-137, 3.7 MBq (0.1 mCi) of strontium-90, 37 MBq (1 mCi) of cobalt-60, 3.7 MBq (0.1 mCi) of radium-226, or 37 MBq (1 mCi) of americium-241 or any other transuranic element, based on the activity indicated on the label.

(4) Each device shall have been received from one of the specific licensees described in paragraph (a)(2) or through a transfer made under paragraph (b)(9).

(b) Each person who acquires, receives, possesses, uses, or transfers radioactive material in a device pursuant to the general license specified in subsection (a) shall comply with all of the following requirements:

(1) Each person subject to this subsection shall ensure that all labels affixed to the device at the time of receipt and bearing a statement that removal of the label is prohibited are maintained and shall comply with all instructions and precautions provided by these labels.
(2) Each person subject to this subsection shall ensure that the device is tested for leakage of radioactive material and proper operation of the on-off mechanism and indicator, if any, at no longer than six-month intervals or at any other intervals specified in any manufacturer's label affixed to the device, except as follows:

(A) The person shall not be required to test devices containing only krypton for leakage of radioactive material.

(B) The person shall not be required to test, for any purpose, any device containing only tritium, not more than 100 microcuries of other beta-emitting or gamma-emitting material, or 10 microcuries of alpha-emitting material or any device held in storage in the original shipping container before initial installation.

(3) Each person subject to this subsection shall ensure that the tests required by paragraph (b)(2) and other operations involving testing, installation, servicing, and removal from installation of the radioactive material, its shielding, or containment are performed in compliance with one of the following:

(A) In accordance with instructions provided on labels affixed to the device; or

(B) by a person holding a specific license issued under this part or equivalent regulations of NRC or an agreement state to perform the tests and other operations.

(4)(A) Each person subject to this subsection shall maintain records showing compliance with the requirements of paragraphs (b)(2) and (b)(3). The records shall show the results of each test. The records also shall show the dates of the testing, installation, servicing, or removal from installation of the radioactive material, its shielding, or containment and the name of each person performing one or more of these tests and other operations.

(B) Each person shall maintain records of tests for leakage of radioactive material required by paragraph (b)(2) for three years after the next required leak test is performed or until the sealed source is transferred or disposed of. Each person shall maintain records of tests of the on-off mechanism and indicator, as required by paragraph (b)(2), for three years after the next required test of the on-off mechanism and indicator is performed or until the sealed source is transferred or disposed of. Each person shall maintain the records required by paragraph (b)(3) for three years from the date of the recorded event or until the device is transferred or disposed of.
(5) Upon a failure of or damage to, or any indication of a possible failure of or damage to, the shielding of the radioactive material or the on-off mechanism or indicator, or upon the detection of 0.005 microcurie or more removable radioactive material, each person subject to this subsection shall take the following actions:

(A) Immediately suspend operation of the device until either of the following conditions is met:

   (i) The device has been repaired by the manufacturer or other person holding a specific license issued under this part or equivalent regulations of NRC or an agreement state to repair the device; or

   (ii) the device is transferred to a person authorized by a specific license to receive the radioactive material contained in the device;

(B) within 30 days, furnish to the secretary a report containing a brief description of the event and the remedial action taken; and

(C) within 30 days, if contamination of the premises or the environs is likely, furnish to the secretary a plan for ensuring that the premises and environs are acceptable for unrestricted use. The criteria for unrestricted use specified in K.A.R. 28-35-205 [p.185] may be applicable, as determined by the secretary.

(6) A person subject to this subsection shall not abandon the device.

(7) A person shall not export any device containing radioactive material except in accordance with 10 CFR part 110.

(8) (A) Each person shall transfer or dispose of any device containing radioactive material only by export as provided in paragraph (b)(7), by transfer to another general licensee as authorized in paragraph (b)(9), or to a person authorized to receive the device by a specific license issued under this part or equivalent regulations of NRC or an agreement state.

(B) Each person shall furnish a report to the department within 30 days after the export of the device or the transfer of the device to a specific licensee. The report shall contain the following information:

   (i) The identification of the device by manufacturer's name, model number, and serial number;

   (ii) the name, address, and license number of the person receiving the device; and

   (iii) the date of the transfer.
(C) Each person shall obtain written department approval before transferring the device to any other specific licensee not specifically identified in paragraph (b)(8)(A). The holder of a specific license may transfer a device for possession and use under its own specific license without approval, if the holder performs the following:

(i) Either verifies that the specific license authorizes the possession and use or applies for and obtains an amendment to the license authorizing the possession and use;

(ii) ensures that the device is labeled in compliance with these regulations. The label shall retain the name of the manufacturer, the model number, and the serial number;

(iii) obtains the manufacturer's or initial transferee's information concerning maintenance, including leak testing procedures that are applicable under the specific license; and

(iv) reports the transfer as required by paragraph (b)(8)(B).

(9) Any person subject to this subsection may transfer the device to another general licensee only if either of the following conditions is met:

(A) The device remains in use at a particular location. In this case, the transfereeor shall give the transferee a copy of this regulation and any safety documents identified in any label affixed to the device and, within 30 days of the transfer, provide a written report to the secretary containing identification of the device by manufacturer's name, model number, and serial number; the name and address of the transferee; and the name, telephone number, and position of an individual who can be contacted by the secretary concerning the device.

(B) The device is held in storage in the original shipping container at its intended location of use before initial use by a general licensee.

(10) Each person subject to this subsection shall comply with the provisions of K.A.R. 28-35-228a [p.239] and K.A.R. 28-35-229a [p.240] relating to reports of radiation incidents, theft, or loss of licensed material, but shall be exempt from the other requirements of parts 4 and 10 of these regulations.

(11) Each person shall respond to all written requests from the department to provide information relating to the general license within 30 calendar days of the date of the request or on or before
any other deadline specified in the request. If the person cannot provide the requested information within the allotted time, the person, within that same time period, shall request a longer period to supply the information by submitting a letter to the department and shall provide written justification as to why the person cannot comply.

(12) Each general licensee shall appoint an individual responsible for having knowledge of the appropriate regulations and requirements and the authority for taking required actions to comply with appropriate regulations and requirements. The general licensee, through this individual, shall ensure day-to-day compliance with the appropriate regulations and requirements. This appointment shall not relieve the general licensee of any of the licensee's responsibility in this regard.

(13)(A) Each person shall register, in accordance with paragraph (b)(13)(B), each device generally licensed as required by this regulation. Each address for a location of use, as described in paragraph (b)(13)(B)(iv), shall represent a separate general licensee and shall require a separate registration and fee.

(B) In registering each device, the general licensee shall furnish the following information and any other information specifically requested by the department:

(i) The name and mailing address of the general licensee;
(ii) information about each device as indicated on the label, including the manufacturer's name, the model number, the serial number, and the radioisotope and activity;
(iii) the name, title, and telephone number of the responsible person appointed as a representative of the general licensee under paragraph (b)(12)
(iv) the address or location at which each device is used or stored, or both. For each portable device, the general licensee shall provide the address of the primary place of storage;
(v) certification by the responsible representative of the general licensee that the information concerning each device has been verified through a physical inventory and a check of the label information; and
(vi) certification by the responsible representative of the general licensee that the person is aware of the requirements of the general license.
(14) Each person shall report any change in the mailing address for the location of use, including any change in the name of the general licensee, to the department within 30 days of the effective date of the change. For a portable device, a report of address change shall be required only for a change in the primary place of storage of the device.

(15) No person may store a device that is not in use for longer than two years. If any device with shutters is not being used, the shutters shall be locked in the closed position. The testing required by paragraph (b)(2) shall not be required to be performed during the period of storage only. If the device is put back into service or transferred to another person and was not tested at the required test interval, the device shall be tested for leakage before use or transfer, and all shutters shall be tested before use. Each device kept in storage for future use shall be excluded from the two-year time limit if the general licensee performs quarterly physical inventories of the device while the device is in storage.

(c) Nothing in this regulation shall be deemed to authorize the manufacture or import of any device containing radioactive material.


28-35-178c. General license to install devices generally licensed in K.A.R. 28-35-178b [p.80]. Any person who holds a specific license issued by the U.S. nuclear regulatory commission or an agreement state authorizing the holder to manufacture, install, or service a device described in K.A.R. 28-35-178b [p.80] is hereby granted a general license to install and service such a device in this state, if:

(a) The device has been manufactured, labeled, installed and serviced in accordance with the provisions of the specific licenses issued in regard to manufacturing, labeling, installing and servicing the device; and
(b) Such person assures that all labels required to be affixed to the device are in place. (Authorized by and implementing K.S.A. 1984 Supp. 48-1607; effective, T-86-37, Dec. 11, 1985; effective May 1, 1986.)

(a) A general license is hereby issued to acquire, possess, and use tritium or promethium-147 contained in luminous safety devices for use in aircraft if:
   (1) the device contains not more than 10 curies of tritium or 300 millicuries of promethium-147; and
   (2) the device has been manufactured, assembled or imported in accordance with a specific license, issued under the provisions of section 32.53 of the regulations of the United States nuclear regulatory commission or manufactured or assembled in accordance with a specific license issued by an agreement state, which authorizes manufacture or assembly of the device for distribution to persons generally licensed by the agreement state.
(b) Persons who acquire, possess or use luminous safety devices pursuant to the general license issued in subsection (a) of this regulation shall be exempt from the requirements of parts 4 and 10 of these regulations, except that they shall comply with the provisions of K.A.R. 28-35-228a [p.239] and 28-35-229a [p.240].
(c) The general license issued in this regulation shall not authorize the manufacture, assembly or repair, or the importation or exportation, of luminous safety devices containing tritium or promethium-147.
(d) The general license issued in this regulation shall not authorize the acquisition, possession or use of promethium-147 contained in instrument dials. (Authorized by and implementing K.S.A. 1985; effective May 1, 1986.)

28-35-178e. Americium-241 or radium-226 in the form of calibration or reference sources. (a) A general license to acquire, possess, use and transfer, in accordance with the provisions of subsections (b) and (c), americium-241 or radium-226 in the form of calibration or reference sources is hereby issued to any person who holds a specific license issued by the nuclear regulatory commission that authorizes the agency to acquire, possess, use, and
transfer by-product material, source material, or special nuclear material.

(b) The general license issued in subsection (a) shall apply only to calibration or reference sources that have been manufactured or initially transferred in accordance with the specifications contained in a specific license issued by the secretary, the nuclear regulatory commission, or an agreement state.

(c) The general license issued in subsection (a) shall be subject to the provisions of K.A.R. 28-35-184a [p.141], and to all of the provisions of parts 4 and 10 of these regulations. In addition, persons who acquire, possess, use, and transfer one or more calibration or reference sources pursuant to this general license shall meet the following requirements:

(1) Not possess, at any one time, at any one location of storage or use, more than 5 microcuries of either americium-241 or radium-226 in such sources;

(2) not receive, possess, use, or transfer such a source unless the source, or the storage container, bears a label that includes the following statement or a substantially similar statement that contains the information called for in the following statement:

“The receipt, possession, use and transfer of this source, Model ______, Serial No. ______, are subject to a general license and the regulations of the United States Nuclear Regulatory Commission or of a State with which the commission has entered into an agreement for the exercise of regulatory authority. Do not remove this label.

CAUTION—RADIOACTIVE MATERIAL—THIS SOURCE CONTAINS AMERICIUM-241 (or RADIUM-226). DO NOT TOUCH RADIOACTIVE PORTION OF THIS SOURCE

(Name of manufacturer or initial transferor)”; 

(3) not transfer, abandon, or dispose of such source except by transfer to a person authorized by a license issued by the secretary, the nuclear regulatory commission, or an agreement state to receive the source;

(4) store such source, except when the source is being used, in a closed container designed and constructed to contain either americium-241 or radium-226 that might otherwise escape during storage; and
(5) not use the source for any purpose other than the calibration of radiation detectors or the standardization of other sources.

(d) The general license issued in this regulation shall not authorize the manufacture, or the importation or exportation, of calibration or reference sources containing either americium-241 or radium-226. (Authorized by and implementing K.S.A. 48-1607; effective, T-86-37, Dec. 11, 1985; effective May 1, 1986; amended March 18, 2011.)

28-35-178f. General license to own radioactive material.
A general license is hereby issued to own radioactive material without regard to quantity. However, a general licensee under this regulation is not authorized to manufacture, produce, transfer, receive, possess, use, import or export radioactive material, except as authorized in a specific license. (Authorized by and implementing K.S.A. 1984 Supp. 48-1607; effective, T-86-37, Dec. 11, 1985; effective May 1, 1986.)

28-35-178g. General license for strontium-90 in ice detection devices. (a) A general license is hereby issued to own, acquire, possess, use and transfer strontium-90 contained in ice detection devices if each device contains not more than 50 microcuries of strontium-90 and if each device is manufactured or initially transferred in accordance with the specifications contained in a license issued to the manufacturer by the secretary, the U.S. nuclear regulatory commission or an agreement state.

(b) Persons who own, acquire, possess, use, or transfer strontium-90 contained in ice detection devices pursuant to the general license issued in subsection (a) of this section:

(1) Shall, if visually observable damage to the device occurs, including a bend or crack or discoloration from overheating, discontinue use of the device until it has been inspected, tested for leakage and repaired by a person holding a specific license issued by the secretary, the U.S. nuclear regulatory commission or an agreement state to manufacture or service the device, or shall dispose of the device pursuant to the provisions of K.A.R. 28-35-223a [p.225];
(2) Shall assure that all labels affixed to the device at the time of receipt, and which bear a statement that prohibits removal of the labels, are maintained thereon;

(3) Shall be exempt from the requirements of parts 4 and 10 of these regulations, except that such persons shall comply with the provisions of K.A.R. 28-35-223a [p.225], 28-35-228a [p.239] and 28-35-229a [p.240].

(c) This general license shall not authorize the manufacture, assembly, disassembly or repair, or the importation or exportation, of strontium-90 in ice detection devices. (Authorized by and implementing K.A.R. 1984 Supp. 48-1607; effective, T-86-37, Dec. 11, 1985; effective May 1, 1986.)

28-35-178h. General license for use of by-product material for certain in vitro clinical or laboratory testing. (a) A general license is hereby issued to any physician, veterinarian in the practice of veterinary medicine, clinical laboratory or hospital to acquire, possess, use and transfer in accordance with the provisions of subsections (b), (c), (d), (e), and (f) of this section, the following radioactive materials in prepackaged units for use in any of the following stated tests:

(1) Iodine-125, in units not exceeding 10 microcuries each, for use in in vitro clinical or laboratory tests not involving internal or external administration of radioactive material, or the radiation therefrom, to human beings or animals.

(2) Iodine-131, in units not exceeding 10 microcuries each, for use in in vitro clinical or laboratory tests not involving internal or external administration of radioactive material, or the radiation therefrom, to human beings or animals.

(3) Carbon-14, in units not exceeding 10 microcuries each, for use in in vitro clinical or laboratory tests not involving internal or external administration of radioactive material, or the radiation therefrom, to human beings or animals.

(4) Hydrogen-3 (tritium), in units not exceeding 50 microcuries each, for use in in vitro clinical or laboratory tests not involving internal or external administration of radioactive material, or the radiation therefrom, to human beings or animals.

(5) Iron-59, in units not exceeding 20 microcuries each, for use in in vitro clinical or laboratory tests not involving internal or
external administration of radioactive material, or the radiation therefrom, to human beings or animals.

(6) Selenium-75, in units not exceeding 10 microcuries each, for use in in vitro clinical or laboratory tests not involving internal or external administration of radioactive material, or the radiation therefrom, to human beings or animals.

(7) Mock Iodine-125 reference or calibration sources, in units not exceeding 0.05 microcuries of Iodine-129 and 0.005 microcurie of americium241 each, for use in in vitro clinical or laboratory tests not involving internal or external administration of radioactive material, or the radiation therefrom, to human beings or animals.

(8) Cobalt-57, in units not exceeding 10 microcuries each, for use in in vitro clinical or laboratory tests not involving internal or external administration of radioactive material or the radiation therefrom, to human beings or animals.

(b)(1) A person shall not acquire, possess, use or transfer radioactive material pursuant to the general license issued in subsection (a) of this section until the person has filed form RH-31, "Registration Certificate—In Vitro Testing with Radioactive Material Under General License," with the secretary and has received from the secretary a validated copy of the form, with a registration number assigned, or until the person has been authorized pursuant to K.A.R. 28-35-181d(d) [p.106] to use radioactive material under the general license issued in subsection (a) of this regulation.

(2) Each person who files a form RH-31 shall provide all the information requested by that form.

(c) Each person who acquires, possesses, or uses radioactive material pursuant to the general license issued in subsection (a) of this section:

(1) Shall not possess, at any one time, at any one location of storage or use, a total amount of iodine-125, iodine-131, selenium-75, cobalt-57 or iron-59 in excess of 200 microcuries;

(2) shall store the radioactive material, until used, in the original shipping container or in a container providing equivalent radiation protection;

(3) shall use the radioactive material only for the uses authorized in subsection (a) of this section;
(4) shall not transfer the radioactive material except by transfer to a person authorized to receive it under a license issued by the secretary, the U.S. nuclear regulatory commission or an agreement state, and shall not transfer the radioactive material in any manner other than in the unopened, labeled shipping container as received from a supplier; and

(5) shall dispose of mock iodine-125 reference or calibration sources in accordance with the requirements of K.A.R. 28-35-223a.

(d) Each general licensee shall not receive, acquire, possess, or use radioactive material pursuant to subsection (a) of this section:

(1) Except as prepackaged units which are labeled in accordance with the provisions of a specific license issued by the secretary, the U.S. nuclear regulatory commission, or an agreement state; and

(2) Unless the following statement, or a substantially similar statement which contains the information called for in the following statement, appears on a label affixed to each prepackaged unit or appears in a leaflet or brochure which accompanies the package:

“This radioactive material may be received, acquired, possessed, and used only by physicians, veterinarians in the practice of veterinary medicine, clinical laboratories or hospitals and only for in vitro clinical or laboratory tests not involving internal or external administration of the material, or the radiation therefrom, to human beings or animals. Its receipt, acquisition, possession, use, and transfer are subject to the regulations and a general license of the U.S. nuclear regulatory commission or of a state with which the commission has entered into an agreement for the exercise of regulatory authority.

(Name of Manufacturer)”

(e) Each person possessing or using radioactive materials under the general license issued in subsection (a) of this section shall file a written report with the secretary of any change in the information furnished on form RH-31. The report shall be filed within 30 days after the effective date of any change.

(f) Any person using radioactive material pursuant to the general license issued in paragraph (1) of subsection (a) shall be exempt from the requirements of parts 4 and 10 of these regulations with respect to radioactive materials covered by that general license,

28-35-178i. General licenses for certain units of radium-226. (a) Subject to the limitations in subsections (b), (c) and (d), a general license is hereby issued to any person to acquire, possess, use, and transfer radium-226 contained in the following products if manufactured before the effective date of this regulation:

1. Antiquities originally intended for use by the general public. For the purposes of this paragraph, "antiquities" shall mean products originally intended for use by the general public and distributed in the late 19th and early 20th centuries, including radium emanator jars, revigators, radium water jars, radon generators, refrigerator cards, radium bath salts, and healing pads;

2. Intact timepieces containing more than 0.037 megabecquerel (1 microcurie), nonintact timepieces, and timepiece hands and dials no longer installed in timepieces;

3. Luminous items installed in air, marine, or land vehicles;

4. All other luminous products not listed in this subsection, if not more than 100 items are used or stored at the same location at any one time; and

5. Small radium sources containing not more than 0.037 megabecquerel (1 microcurie) of radium-226.

(b) A person shall not acquire, possess, use, or transfer radium-226 pursuant to the general license issued in subsection (a) until the person has filed form RH-37 with the secretary and has received from the secretary a validated copy of the form, with a certification number assigned. Each person filing a form RH-37 shall provide all the information required by that form.

(c) Each person who acquires, receives, possesses, uses, or transfers by-product material in accordance with the general license issued in subsection (a) shall meet the following requirements:

1. Notify the department of any indication of possible damage to the product that indicates a potential loss of the radioactive material. A report containing a brief description of the event and the remedial action taken shall be provided to the department within 30 days of the incident;
(2) not abandon any products containing radium-226. The product and any radioactive material from the product shall be disposed of only according to K.A.R. 28-35-165 [p.71] or by transfer to a person authorized by a specific license to receive the radium-226 in the product or as otherwise approved by the department;

(3) not export any products containing radium-226 except in accordance with K.A.R. 28-35-178b [p.80];

(4) dispose of any products containing radium-226 at a disposal facility authorized to dispose of radioactive material in accordance with any federal or state solid or hazardous waste law, including the solid waste disposal act of 1965, 42 U.S.C. 6901 through 6992k as amended, as authorized under 42 U.S.C. 15801 et seq., by transfer to a person authorized to receive radium-226 by a specific license issued under K.A.R. 28-35-180a [p.96] or equivalent regulations of an agreement state, or as otherwise approved by the department; and

(5) respond to any written request from the department to provide information relating to the general license within 30 calendar days of the date of the request or other time specified in the request. If the general licensee cannot provide the requested information within the allotted time, that licensee shall, within that same time period, request a longer period to supply the information by submitting a letter to the department and shall provide written justification as to why the person cannot comply.

(d) Each general licensee under this regulation shall file with the secretary a written report of any changes in the information filed in form RH-37. The report shall be furnished within 30 days after the effective date of the change.

(e) Each general licensee under this regulation shall be exempt from the requirements of parts 4 and 10 of these regulations with respect to the radioactive material covered by the general license.

(f) The general license specified in subsection (a) shall not authorize the manufacture, assembly, disassembly, repair, or import of any products containing radium-226, except that timepieces may be disassembled and repaired.

(g) Any general licensee under this regulation who is an individual member of the public may submit an application to the
28-35-178j. General license for use of radioactive material for certain in vivo clinical or laboratory testing. (a) Except as provided in subsections (b) and (c), each person shall be exempt from the license requirements in part 3 and part 6 of these regulations if the person receives, possesses, uses, transfers, owns, or acquires any capsules containing 37 kBq (1 uCi) of carbon-14 urea, allowing for nominal variation that may occur during the manufacturing process for in vivo diagnostic use for humans.

(b) Before using the capsules specified in subsection (a) for research involving human subjects, each person shall apply and shall be considered for approval for a specific license. Each person shall be required to have a specific license before engaging in the research specified in this subsection.

(c) Before manufacturing, preparing, processing, producing, packaging, repackaging, or transferring the capsules specified in subsection (a) for commercial distribution, each person shall apply and shall be considered for approval for a specific license. Each person shall be required to have a specific license before performing any of the actions specified in this subsection.

(d) Nothing in this regulation shall exempt any person from applicable FDA requirements, other federal requirements, and state requirements governing receipt, administration, and use of drugs. (Authorized by and implementing K.S.A. 48-1607; effective Dec. 30, 2005; amended March 18, 2011.)


28-35-179a. Application for specific license; renewal or amendment. (a) Any person may file a written application with the secretary for a specific license to acquire, possess, use, or transfer radioactive material. Each person shall file a written application with the secretary to renew or amend any specific license. Each application for a specific license, or a renewal or an amendment of an existing license, shall be submitted on the appropriate form.
furnished by the secretary. Each person filing an application shall provide all the information requested on the application form, and any additional relevant information requested by the secretary.

(b) Each application filed with the secretary shall be signed by the applicant or licensee, or by a person authorized to act for or on behalf of the applicant or licensee.

(c) Any application may incorporate, by reference, information provided in applications, reports, or other documents previously filed with the secretary. Each reference to information previously filed with the secretary shall be clear and specific.

(d) Any application for a specific license may include a request for a license authorizing activity at one or more installations or locations.

(e) Except as provided in subsections (f), (g), and (h), each application for a specific license to use radioactive material in the form of a sealed source or in a device that contains the sealed source shall include either of the following:

1. Identification of the sealed source or device by manufacturer and model number as registered with the department, nuclear regulatory commission (NRC), or an agreement state; or

2. Sufficient information about the design, manufacture, prototype testing, quality control program, labeling, proposed uses, and leak testing to provide reasonable assurance that the radiation safety properties of the sealed source or device are adequate to protect health and minimize danger to life and property. For a device, the application shall also include sufficient information about installation, service and maintenance, operating and safety instructions, and potential hazards, to provide reasonable assurance that the radiation safety properties of the sealed source or device are adequate to protect health and minimize danger to life and property.

(f) For any sealed source or device manufactured before October 23, 2012 that is not registered with the department, NRC, or an agreement state and for which the applicant is unable to provide the information specified in this regulation, the application shall include the following:

1. All available information specified in K.A.R. 28-35-181e [p.110], concerning the sealed source, and, if applicable, the device; and
(2) sufficient additional information to demonstrate reasonable assurance that the radiation safety properties of the sealed source or device are adequate to protect health and minimize danger to life and property. The information shall include a description of the sealed source or device, a description of radiation safety features, the intended use and associated operating experience, and the results of the most recent leak test.

(g) For sealed sources and devices allowed to be distributed without the registration of safety information as required in this regulation, the applicant may supply only the name of the manufacturer, model number, and radionuclide quantity.

(h) If it is not feasible to identify each sealed source and device individually, the applicant may propose constraints on the number and type of sealed sources and devices to be used and the conditions under which the sealed sources and devices will be used, instead of identifying each sealed source and device. (Authorized by and implementing K.S.A. 48-1607; effective, T-86-37, Dec. 11, 1985; effective May 1, 1986; amended May 4, 2018.)


28-35-180a. General requirements for the issuance of specific licenses. Each application for a specific license shall be approved only if the application meets the requirements of these regulations.

(a) Each applicant shall be required to be qualified by reason of training and experience to use the material in question for the purpose requested, in accordance with these regulations, and in a manner that will protect public health and safety and the environment.

(b) The proposed equipment, facilities, and procedures used by each applicant shall protect public health and safety and the environment.

(c) A specific license shall be approved only if the secretary determines that the license is protective of public health and safety and the environment.

(d) Each applicant shall meet the requirements in these regulations for the particular license sought.
(e)(1) Each application for a license for commercial waste disposal, source material milling, or any other operation that the secretary determines will affect the environment shall meet the requirement specified in this paragraph. Each application shall include information that permits the secretary to weigh the environmental, economic, technical, and other benefits against the environmental costs and alternatives to ensure the protection of public health and safety and the environment.

(2) The approval of each application specified in paragraph (e)(1) shall be based upon the following:

(A) The information specified in paragraph (e)(1) and other information as necessary; and

(B) the information required by 10 C.F.R. 51.45, as in effect on April 30, 1992.

(f) Each applicant shall be authorized to begin construction only after the issuance of the license. Commencement of construction before issuance of the license shall be grounds for denial of the license application. "Commencement of construction," as used in this regulation, shall mean any clearing of land, excavation, or other substantial action that would adversely affect the environment of a site.

(g) Each applicant for a license, other than a renewal, shall describe in the application how the facility design and procedures for operation will minimize, to the extent practicable, contamination of the facility and the environment, facilitate eventual decommissioning, and minimize, to the extent practicable, the generation of radioactive waste.

(h) Each licensee who manufactures a nationally tracked source shall assign a unique serial number to each nationally tracked source manufactured by the licensee. Each serial number shall be composed only of alphanumeric characters.

(i) Each licensee shall conduct operations to minimize the introduction of residual radioactivity into the facility out to the site boundary, including the subsurface, in accordance with the existing radiation protection requirements and radiological criteria for license termination in these regulations. (Authorized by and implementing K.S.A. 48-1607; effective, T-86-37, Dec. 11, 1985; effective May 1, 1986; amended Sept. 20, 1993; amended Nov. 1,

(a) Each applicant for a specific license authorizing the possession and use of unsealed radioactive material with a half-life greater than 120 days and in quantities exceeding $10^5$ times the applicable quantities specified in K.A.R. 28-35-201 shall submit a decommissioning funding plan as described in subsection (e) of this regulation. Each applicant shall also submit the decommissioning funding plan if a combination of isotopes is involved and if $R$ divided by $10^5$ is greater than one, where $R$ is defined here as the sum of the ratios of the quantity of each isotope to the applicable value specified in K.A.R. 28-35-201.

(b) Each applicant for a specific license authorizing the possession and use of radioactive material with a half-life greater than 120 days and in quantities specified in table I shall submit either of the following:

1. A decommissioning funding plan as described in subsection (e); or
2. A certification that financial assurance for decommissioning has been provided in the amount prescribed by table I, using one of the methods described in subsection (f). The certification may state that the appropriate assurance is to be obtained after the application has been approved and the license has been issued, but before the receipt of licensed material. If the applicant defers execution of the financial instrument required under subsection (f) until after the license has been issued, a signed original of the financial instrument shall be submitted to the department before the applicant receives the licensed material. If the applicant does not defer execution of the financial instrument required under subsection (f), the applicant shall submit to the department, as part of the certification, a signed original of the financial instrument.

(c) Each holder of a specific license that is a type specified in subsection (a) or (b) shall provide financial assurance for decommissioning in accordance with the following requirements:

1. Each holder of a specific license that is a type specified in subsection (a) shall submit a decommissioning funding plan as specified in subsection (e) or a certification of financial assurance
for decommissioning in an amount equal to at least $1,125,000.00. Each licensee shall submit the plan or certification to the department in accordance with the criteria specified in this regulation. If the licensee submits a certification of financial assurance rather than a decommissioning funding plan, the licensee shall include a decommissioning funding plan in any application for license renewal.

(2) Each holder of a specific license that is a type specified in subsection (b) shall submit a decommissioning funding plan as specified in subsection (e) or a certification of financial assurance for decommissioning. Each licensee shall submit the plan or certification to the department, in accordance with the requirements specified in this regulation.

(d) The amounts of financial assurance required for decommissioning, by quantity of material, shall be those specified in table I.

| Table I |
| Financial assurance for decommissioning by quantity of material |
| If the possession limit is greater than $10^4$ but less than or equal to $10^5$ times the applicable quantities specified in K.A.R. 28-35-201, in unsealed form | $1,125,000.00 |
| For a combination of isotopes, if $R$, as defined in subsection (a), divided by $10^4$ is greater than one, but $R$ divided by $10^3$ is equal to or less than one | $1,125,000.00 |
| If the possession limit is greater than $10^3$ but less than or equal to $10^4$ times the applicable quantities specified in K.A.R. 28-35-201, in sealed form | $225,000.00 |
| For a combination of isotopes, if $R$, as defined in subsection (a), divided by $10^3$ is greater than one, but $R$ divided by $10^4$ is less than or equal to one | $225,000.00 |
| If the possession limit is greater than $10^{10}$ times the applicable quantities specified in K.A.R. 28-35-201, in sealed sources or foils | $113,000.00 |
(e) Each decommissioning funding plan shall contain the following:

(1) A cost estimate for decommissioning in an amount including the following:

(A) The cost of an independent contractor to perform all decommissioning activities;

(B) the cost of meeting the requirements for unrestricted use specified in K.A.R. 28-35-205 [p.185]. However, if the applicant or licensee can demonstrate the ability to meet the provisions of K.A.R. 28-35-205a [p.186] the cost estimate may be based on meeting the requirements in K.A.R. 28-35-205a [p.186];

(C) the volume of on-site subsurface material containing residual radioactivity that will require remediation to meet the requirements for license termination; and

(D) a contingency factor;

(2) identification of and justification for using the key assumptions contained in the decommissioning cost estimate;

(3) a description of the method of ensuring funds for decommissioning from subsection (f), including means for adjusting cost estimates and associated funding levels periodically over the life of the facility;

(4) a certification by the licensee that financial assurance for decommissioning has been provided in the amount of the cost estimate for decommissioning;

(5) a signed original of the financial instrument obtained to satisfy the requirements in subsection (f); and

(6) at the time of license renewal and at intervals not longer than three years, the decommissioning funding plan with adjustments necessary to account for changes in costs and the extent of contamination. The amount of financial assurance shall not be reduced without first obtaining the approval of an updated decommissioning funding plan. The decommissioning funding plan shall update the information submitted with the original or prior approved plan and shall specifically consider the effect of the following events on decommissioning costs:

(A) Spills of radioactive material producing additional residual radioactivity in on-site subsurface material;
(B) waste inventory exceeding the amount previously estimated;
(C) waste disposal costs exceeding the amount previously estimated;
(D) facility modifications;
(E) changes in authorized possession limits;
(F) actual remediation costs exceeding the previous cost estimate;
(G) on-site disposal; and
(H) use of a settling pond.

(f) Each licensee shall provide financial assurance for decommissioning by one or more of the following methods:

(1) Prepayment. "Prepayment" shall mean the deposit of cash or liquid assets before the start of operation into a trust account acceptable to the secretary that is segregated from the licensee's assets and outside of the licensee's administrative control. The deposit shall consist of an amount that is sufficient to pay decommissioning costs. The adequacy of the trust funds shall be based on an assumed annual rate of return of one percent on the funds deposited into the trust.

(2) A surety instrument, insurance policy, or other guarantee method. The licensee may use a surety instrument, insurance policy, or other similar means to guarantee that decommissioning costs will be paid. A surety instrument may be in the form of a surety bond, letter of credit, or line of credit. A parent company's guarantee of funds for decommissioning costs based on a financial test may be used if the guarantee and test meet the requirements of K.A.R. 28-35-203 [p.180]. A parent company's guarantee shall not be used in combination with other financial methods to meet the requirements in this regulation. A guarantee of funds by the applicant or licensee for decommissioning costs based on a financial test may be used if the guarantee and test meet the requirements of K.A.R. 28-35-203 [p.180]. A guarantee by the applicant or licensee shall not be used in combination with any other financial methods to meet the requirements in this regulation or in any situation in which a parent company of the applicant or licensee holds majority control of the voting stock of the company. Each surety instrument or insurance policy used to provide financial assurance for decommissioning shall contain the following requirements:
(A) The surety instrument or insurance policy shall be open-ended or, if written for a specified term, shall be renewed automatically, unless 90 days or more before the renewal date, the insurer notifies the department, the beneficiary, and the licensee of the insurer's intention not to renew. The surety instrument or insurance policy shall also provide that the full face amount will be paid to the beneficiary automatically before the expiration without proof of forfeiture if the licensee fails to provide a replacement that meets the requirements of this regulation within 30 days after receipt of notification of cancellation.

(B) The surety instrument or insurance policy shall be payable to an approved trust established for decommissioning costs. The trustee may include an appropriate state or federal agency or an entity that has the authority to act as a trustee and whose trust operations are regulated and examined by a federal or state agency.

(C) The surety instrument or insurance policy shall remain in effect until the license is terminated by the department.

(3) External sinking fund. A licensee may provide financial assurance for decommissioning through an external sinking fund in which deposits are made at least annually, coupled with a surety instrument or insurance policy. The value of the surety instrument or insurance policy may decrease by the amount accumulated in the sinking fund. "External sinking fund" shall mean a fund that meets both of the following conditions:

(A) Is established and maintained by setting aside funds periodically in an account segregated from the licensee's assets and outside the licensee's administrative control; and

(B) contains a total amount of funds sufficient to pay the decommissioning costs when termination of the operation is expected. An external sinking fund may be in the form of a trust, escrow account, government fund, certificate of deposit, or deposit of government securities. The surety or insurance provisions shall meet the requirements specified in this subsection.

(4) Statement of intent. Any federal, state, or local government licensee may submit a statement of intent containing a cost estimate for decommissioning or an amount based on table I of this regulation and indicating that funds for decommissioning will be obtained when necessary.

(g) Each person licensed under subsections (a) through (f) shall keep records of all information that is relevant to the safe and
effective decommissioning of the facility. The records shall be kept in an identified location until the license is terminated by the department. If records of relevant information are kept for other purposes, the licensee may refer to these records and the location of these records within the records kept pursuant to this subsection.

(h) Each licensee shall maintain decommissioning records, which shall consist of the following information:

(1) Records of spills or other unusual occurrences involving the spread of contamination in and around the facility, equipment, or site. These records may be limited to records of instances in which contamination remains after any cleanup procedures or when there is reasonable likelihood that contaminants could have spread to inaccessible areas. These records shall include any known information identifying the nuclides, quantities, forms, and concentrations involved in the spill or occurrence;

(2) drawings of the following, both as originally built and, if applicable, as modified:

(A) The structures and equipment in restricted areas where radioactive materials are used or stored, or both; and

(B) the locations of possible inaccessible contamination. If the licensee refers to required drawings other than those kept pursuant to this regulation, the licensee shall not be required to index each relevant document individually. If drawings are not available, the licensee shall substitute available information concerning these areas and locations;

(3) a list of the following information, which shall be contained in a single document and updated every two years:

(A) All areas designated and formerly designated as restricted areas;

(B) all areas outside of restricted areas that require the documentation specified in this subsection;

(C) all areas outside of restricted areas where current and previous wastes have been buried and documented as specified in K.A.R. 28-35-227j [p.238]; and

(D) all areas outside of restricted areas that contain material so that, if the license expired, the licensee would be required either to decontaminate the area to unrestricted release levels or to apply for approval for disposal as specified in K.A.R. 28-35-225a [p.233]. Those areas containing sealed sources only shall not be
included in the list if the sources have not leaked, no contamination remains in the area after any leak, or the area contains only radioactive materials having half-lives of less than 65 days; and

(4) the following records:

(A) Records of the cost estimate performed for the decommissioning funding plan or records of the amount certified for decommissioning; and

(B) if either a funding plan or certification is used, records of the funding method used for assuring funds.

(i) Each applicant for a specific license shall make available a long-term care fund necessary to provide for the long-term surveillance and care of the radioactive material or waste. Each applicant for any of the following types of specific licenses shall establish the long-term care fund before the issuance of the license or before the termination of the license if the applicant chooses, by providing a surety instrument in lieu of a long-term care fund:

(1) Waste-handling licenses;

(2) source material milling licenses; and

(3) licenses for any facilities formerly licensed by the U.S. atomic energy commission or the nuclear regulatory commission (NRC), if required.

(j)(1) Each applicant shall agree to notify the department, in writing, immediately following the filing of a voluntary or involuntary petition for bankruptcy under any chapter of title 11, bankruptcy, of the United States code by or against any of the following:

(A) The licensee;

(B) any person controlling the licensee or listing the license or licensee as property of the estate; or

(C) any affiliate of the licensee.

(2) The bankruptcy notification shall indicate the following:

(A) The name of the bankruptcy court in which the petition for bankruptcy was filed; and

(B) the date on which the petition was filed. (Authorized by and implementing K.S.A. 48-1607; effective Dec. 30, 2005; amended March 18, 2011; amended May 4, 2018.)
28-35-181a. Specific licenses for human use of radioactive material in medical institutions. An application for a specific license for human use of radioactive material in institutions shall not be approved unless all of the following conditions are met:

(a) The applicant has appointed a radiation safety committee as specified in 10 CFR 35.24(f), which is adopted by reference in K.A.R. 28-35-264 [p.291].

(b) The applicant possesses adequate facilities for the clinical care of patients.

(c) The physician or physicians designated on the application as the user or users have substantial experience in handling and administering radioactive materials and, if applicable, clinical management of radioactive patients.

(d) If the application is for a license to use unspecified quantities or multiple types of radioactive material, the applicant or applicant's staff has substantial experience in the use of a variety of radioactive materials for a variety of human uses. (Authorized by and implementing K.S.A. 48-1607; effective, T-86-37, Dec. 11, 1985; effective May 1, 1986; amended March 18, 2011.)

28-35-181b. Specific licenses to individual physicians for human use of radioactive material. (a) A specific license for the human use of radioactive materials outside of a medical institution shall not be issued to an individual physician unless:

(1) The applicant has access to a hospital and adequate facilities are available for the hospitalization and monitoring of the applicant's radioactive patients when such action is advisable; and

(2) the applicant has extensive experience in the proposed use, handling and administration of radioactive material, and where applicable, clinical management of radioactive patients. The physician shall furnish evidence of this experience with the application for the specific license.

(b) The secretary shall not approve an application by an individual physician or group of physicians for a specific license to receive, possess, or use radioactive material on the premises of a medical institution unless:

(1) The use of radioactive material is limited to:
28-35-181c Radiation Control Program

(A) The administration of radiopharmaceuticals for diagnostic or therapeutic purposes;
(B) the performance of diagnostic studies on patients to whom a radiopharmaceutical has been administered;
(C) the performance of in vitro diagnostic studies; and
(D) calibration and quality control checks of radioactive assay instrumentation, radiation safety instrumentation and diagnostic instrumentation;
(2) the physician brings the radioactive material to the institution for each use and removes the radioactive material from the institution after each use; and
(3) the medical institution or institutions at which the radioactive materials are to be used by the physician or physicians do not hold a specific license under K.A.R. 28-35-181a [p.105].

28-35-181c. Specific license for human use of radioactive material in sealed sources. (a) A specific license for human use of radioactive materials in sealed sources shall not be issued unless the applicant, or if the application is made by an institution, each individual user of the radioactive material:
(1) Has specialized training in the diagnostic or therapeutic use of the sealed source device or extensive experience in the use of the device; and
(2) is a physician.
(b) The applicant shall furnish evidence of the training or experience required by subsection (a) at the time of filing the application for the specific license. (Authorized by and implementing K.S.A. 1984 Supp. 48-1607; effective, T-86-37, Dec. 11, 1985; effective May 1, 1986.)

28-35-181d. Specific licenses for one or more groups of medical uses. (a) Any institution, person, or group of persons meeting the requirements of K.A.R. 28-35-181a [p.105] or 28-35-181b [p.105] may file a written application with the secretary for a specific license to use radioactive material for any group or groups of medical uses. Each application shall meet the requirements of K.A.R. 28-35-179a [p.94] and shall designate the intended group or groups of uses for the radioactive material.
(b) Each application for a specific license to use radioactive material for any group or groups of medical uses shall meet all of the following requirements:

(1) The applicant, or the physician or physicians designated in the application as the individual user or users, has adequate clinical experience in performing the medical use or uses for which application is made.

(2) The applicant's proposed radiation detection instrumentation is adequate for conducting the medical procedures specified in the group or groups of uses for which application is made.

(3) The applicant's radiation safety operating procedures are adequate for the proper handling and disposal of radioactive material involved in the group or groups of uses for which application is made.

(4) The applicant, or the physician or physicians designated in the application as the individual user or users, and all other personnel who will be involved in the preparation and use of the radioactive material have adequate training and experience in the handling of radioactive material. The training and experience shall be appropriate for the conduct of the uses included in the group or groups of uses for which application is made.

(c) Each licensee who is licensed under this regulation shall be subject to the following limitations:

(1) A licensee who has been issued a license for group I, II, IV, or V uses shall not receive, possess, or use radioactive material, except those radiopharmaceuticals manufactured in the form to be administered to the patient, and labeled, packaged, and distributed in accordance with a specific license issued by the secretary, or the United States nuclear regulatory commission or an agreement state.

(2) A licensee who has been issued a license for group III uses shall not receive, possess, or use generators or reagent kits containing radioactive material and shall not use reagent kits that do not contain radioactive material to prepare radiopharmaceuticals containing radioactive material, except for the following:

(A) Reagent kits not containing radioactive material that are approved by the secretary, the United States nuclear regulatory commission, or an agreement state for use by persons licensed pursuant to this regulation for group III medical uses; or
(B) generators or reagent kits containing radioactive material that are manufactured, labeled, packaged, and distributed in accordance with a specific license issued by the secretary, the United States nuclear regulatory commission, or an agreement state.

(3) Each licensee who has been issued a license for group III uses and who uses generators or reagent kits shall elute the generator or process radioactive material with the reagent kit in accordance with instructions that are approved by the secretary, the United States nuclear regulatory commission, or an agreement state and furnished by the manufacturer on the label attached to, or in the leaflet or brochure that accompanies, the generator or reagent kit.

(4) Each licensee who has been issued a license for groups I, II, or III uses and who uses the radioactive material for clinical procedures other than those specified in the product labeling or package insert shall comply with the product labeling regarding the following:
   (A) Chemical and physical form;
   (B) route of administration; and
   (C) dosage range.

(5) A licensee who has been issued a license for group IV uses shall not receive, possess, or use radioactive material unless contained in a source or device that has been manufactured, labeled, packaged, and distributed in accordance with a specific license issued by the secretary, the United States nuclear regulatory commission, or an agreement state.

(d) Each licensee who is licensed under this regulation shall be authorized to use radioactive material under the general license issued in K.A.R. 28-35-178h [p.89] for the specified in vitro uses, without filing form RH-31 as otherwise required by that regulation. However, the licensee shall be subject to the other requirements of K.A.R. 28-35-178h [p.89].

(e) Each licensee who is licensed under this regulation shall be authorized, subject to the provisions of subsections (f) and (g), to receive, possess, and use the following for calibration and reference standards:
   (1) Any radioactive material listed in groups I, II, or III that has a half-life of 100 days or less, in amounts not exceeding 15 millicuries;
(2) any radioactive material listed in group I, II, or III that has a half-life greater than 100 days, in amounts not exceeding 200 microcuries;

(3) technetium-99m, in amounts not exceeding 30 millicuries; and

(4) any radioactive material, in amounts not exceeding three millicuries per source, contained in calibration or reference sources that have been manufactured, labeled, packaged, and distributed in accordance with a specific license issued by the secretary, the United States nuclear regulatory commission, or an agreement state.

(f)(1) Each licensee who possesses sealed sources as calibration or reference sources pursuant to subsection (e) shall cause each sealed source containing radioactive material, other than hydrogen 3, that has a half-life greater than 30 days and that is in any form other than gas to be tested for leakage, contamination, or both at intervals not exceeding six months. In the absence of a certificate from a transferor indicating that a leak test has been made within six months before the transfer of a particular sealed source, that sealed source shall not be used until tested, unless one of the following conditions is met:

(A) The source contains 100 microcuries or less of beta-emitting, gamma-emitting, or beta-emitting and gamma-emitting material, or 10 microcuries or less of alpha-emitting material.

(B) The sealed source is stored and is not being used.

(2) Each leak test required under paragraph (f)(1) shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. The test sample shall be taken from sealed source or from the surfaces of the device in which the sealed source is permanently mounted or stored and on which contamination might be expected to accumulate. Records of leak test results shall be kept in units of microcuries and shall be maintained for inspection by the department.

(3) If the leak test reveals the presence of 0.005 microcurie or more of removable contamination, the licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired, or to be disposed of in accordance with parts 3 and 4 of these regulations. A report shall be filed with the secretary within five days of the test, describing the equipment involved, the test results, and the corrective action taken.
(g) Each licensee who possesses and uses calibration and reference sources pursuant to subsection (e) shall perform the following:

(1) Follow radiation safety and handling instructions that are approved by the secretary, the United States nuclear regulatory commission, or an agreement state and furnished by the manufacturer on the label attached to the source, or permanent container thereof, or in the leaflet or brochure that accompanies the source;

(2) maintain the instructions referenced in paragraph (g)(1) in a legible and conveniently available form; and

(3) conduct a quarterly physical inventory to account for all sources received and possessed. Records of the inventories shall be maintained for inspection by the department and shall include the quantities and kinds of radioactive material, location of sources, and the date of the inventory. (Authorized by and implementing K.S.A. 48-1607; effective, T-86-37, Dec. 11, 1985; effective May 1, 1986; amended July 27, 2007.)


28-35-181f. Special licenses for the introduction of radioactive material into products in exempt concentrations. (a) An application for a specific license to introduce radioactive material into a product or material and to transfer the product or material to any person who is exempt from regulation under K.A.R. 28-35-192b(a) [p.153] shall not be approved unless the applicant submits with the application for the specific license:

(1) A description of the product or material into which the radioactive material is to be introduced;

(2) an explanation of the intended use of the radioactive material;

(3) the method by which the radioactive material is to be introduced;

(4) the concentration of the radioactive material to be introduced;

(5) the control method or methods to be employed to assure that no more than the specified concentration is introduced;
(6) the estimated time interval between introduction of radioactive material into the product or material and the transfer of the product or material;

(7) the estimated concentration of radioactive material that will be present in the product or material at the time of transfer; and

(8) reasonable assurances that:

(A) the concentrations of radioactive material at the time of transfer will not exceed the limitations prescribed in K.A.R. 28-35-198a [p.163], Schedule C;

(B) reconcentration of the radioactive material concentrations exceeding the limitations prescribed in K.A.R. 28-35-198a [p.163], Schedule C is not likely to occur;

(C) use of lower concentrations of radioactive material is not practical or feasible; and

(D) the product or material is not likely to be incorporated in any food, beverage, cosmetic, drug or other commodity or product designed for ingestion or inhalation by, or application to, a human being.

(b)(1) Each person licensed under subsection (a) of this regulation shall file an annual report with the secretary describing the type and quantity of each product or material into which radioactive material has been introduced during the reporting period; the name and address of the person to whom possession of the product of material into which radioactive material has been introduced was transferred; the type and quantity of radioactive material which was introduced into each product or material; and the initial concentration of radioactive material in the product or material at time of transfer of the radioactive material by the licensee.

(2) If no transfers of radioactive materials have been made during a reporting period, the report shall indicate this fact.

(3) Each report shall cover the 12-month period commencing on July 1 of each year. (Authorized by and implementing K.S.A. 1984 Supp. 48-1607; effective, T-86-37, Dec. 11, 1985; effective May 1, 1986.)

28-35-181g. Licensing for industrial radiography operations. (a) Each application for a specific license shall be
considered for approval for the use of licensed material for industrial radiography only if the application contains the following:

(1) A description of a program for training radiographers and radiographer's assistants that meets the requirements of part 7 in these regulations;

(2) the procedures for verifying and documenting the certification status of radiographers and for ensuring that the certification of individuals acting as radiographers remains valid;

(3) the written operating and emergency procedures as specified in part 7 in this article;

(4) a description of a program for inspections of the job performance of each radiographer and radiographer's assistant at intervals not to exceed six months;

(5) a program for inspection and maintenance of radiographic exposure devices, equipment, and storage containers to ensure proper functioning;

(6) a description of the applicant's overall organizational structure as it applies to the radiation safety responsibilities in industrial radiography, including specified delegation of authority and responsibility;

(7) the qualifications of the individual designated as the radiation safety officer;

(8) if the applicant intends to perform leak testing of sealed sources or exposure devices containing depleted uranium (DU) shielding, a description of the procedures for performing the test. The description shall include the following:

(A) The methods of collecting the samples;

(B) the qualifications of the individual who analyzes the samples;

(C) the instruments to be used; and

(D) the methods of analyzing the samples;

(9) if the applicant intends to perform calibrations of survey instruments and alarming ratemeters, a description of the methods to be used and the experience of each person who will perform the calibrations. All calibrations shall be performed according to the procedures described and at the intervals specified in part 7 in these regulations;

(10) identification and description of the location of each field station and permanent radiographic installation;
(11) identification of each location where all records required by this part and the other parts of these regulations will be maintained; and

(12) if the applicant intends to perform underwater radiography, a description of the following:

(A) Radiation safety procedures and radiographer responsibilities unique to the performance of underwater radiography;

(B) radiographic equipment and radiation safety equipment unique to underwater radiography; and

(C) methods of gas-tight encapsulation of equipment.

(b) Each licensee shall retain the records of each inspection for review by the department, for two years from the date the inspection is performed. (Authorized by and implementing K.S.A. 48-1607; effective, T-86-37, Dec. 11, 1985; effective May 1, 1986; amended Dec. 30, 2005.)

28-35-181h. Specific licenses to manufacture and distribute the devices specified in K.A.R. 28-35-178b [p.80]. An application for a specific license to manufacture and distribute one or more of the devices specified in K.A.R. 28-35-178b [p.80] shall not be approved unless the applicant meets the requirements of subsections (a) and (b) of this regulation in addition to meeting all of the additional applicable requirements specified in these regulations.

(a) Each applicant shall submit information about the design, manufacture, prototype testing, quality control, labels, proposed uses, installation, servicing, leak testing, operating and safety instructions, and potential hazards of the device to provide reasonable assurance that the following conditions are met:

(1) The device can be safely operated by individuals not having training in radiological protection;

(2) under ordinary conditions of handling, storage, and use of the device, the radioactive material contained in the device will not be released or inadvertently removed from the device, and it is unlikely that any individual will receive a dose in excess of 10 percent of the limits specified in K.A.R. 28-35-212a [p.192]; and

(3) under accident conditions, including fire and explosion, associated with handling, storage, and use of the device, it is
unlikely that any individual will receive an external radiation dose or dose commitment in excess of the following organ doses:

(A) Whole body; head and trunk; active blood-forming organs; gonads; or lens of eye 15 rems

(B) Hands and forearms; feet and ankles; localized areas of skin averaged over areas no larger than 1 square centimeter 200 rems

(C) Other organs 50 rems.

(b)(1) Each device shall bear a durable, legible, clearly visible label or labels that contain, in clearly identified and separate statements, the following information:

(A) Instructions and precautions necessary to ensure safe installation, operation, and servicing of the device. Operating and service manuals may be identified in the label and used to provide this information;

(B) specification of whether or not leak testing or testing of any on-off mechanism and indicator is required. The information shall include the maximum allowable time intervals between tests and shall identify the radioactive material by isotope, quantity of radioactivity, and date that the quantity was determined; and

(C) the information required in one of the following statements, as appropriate, in the same or a substantially similar form:

(i) "The receipt, possession, use, and transfer of this device, model________, serial no._______, are subject to a general license or the equivalent and the regulations of the U.S. nuclear regulatory commission or a state with which the U.S. nuclear regulatory commission has entered into an agreement for the exercise of regulatory authority. This label shall be maintained on the device in a legible condition. Removal of this label is prohibited."

(ii) "The receipt, possession, use, and transfer of this device, model________, serial no._______, are subject to a general license or the equivalent, and the regulations of a licensing state. This label shall be maintained on the device in a legible condition. Removal of this label is prohibited."
(3) Each device having a separate source housing that provides the primary shielding for the source shall also bear, on the source housing, a durable label containing the device model number and serial number, the isotope and quantity, the words "Caution — Radioactive Material," the radiation symbol described in part 4 of these regulations, and the name of the manufacturer or initial distributor.

(4) Each device containing at least 370 Mbq (10 mCi) of cesium-137, 3.7 Mbq (0.1 mCi) of strontium-90, 37 Mbq (1 mCi) of americium-241 or any other transuranic element based on the activity indicated on the label shall meet the following criteria:
   (A)(i) Bear a permanent label affixed to the source housing if the source housing is separable, including the words "Caution — Radioactive Material"; or
   (ii) bear a permanent label affixed to the device if the source housing is not separable, including the words "Caution — Radioactive Material"; and
   (B) if practicable, bear the radiation symbol described in part 4 of these regulations.

(c) If the device is required to be tested at intervals longer than six months, either for proper operation of the on-off mechanism and indicator, if any, or for leakage of radioactive material, or for both, the applicant shall include in the application sufficient information to demonstrate that the longer interval is justified by the performance characteristics of the device or of similar devices and by design features that have a significant bearing on the probability or consequences of leakage of radioactive material from the device or failure of the on-off mechanism and indicator. In determining the acceptable interval for the test for leakage of radioactive material, the applicant shall address the following in the application:
   (1) The primary containment of the source capsule;
   (2) protection of the primary containment;
   (3) the methods of sealing the primary containment;
   (4) the containment construction materials;
   (5) the form of contained radioactive material;
(6) the maximum temperature withstood during prototype tests;

(7) the maximum pressure withstood during prototype tests;

(8) the maximum quantity of contained radioactive material;

(9) the radiotoxicity of contained radioactive material; and

(10) any prior operating experience with identical devices or similarly designed and constructed devices.

(d) If the general licensee under K.A.R. 28-35-178b [p.80], or under equivalent regulations of an agreement state, is authorized to install the device, collect the sample to be analyzed by a specific licensee for leakage of radioactive material, service the device, test the on-off mechanism and indicator, or remove the device, the applicant shall include in the application the written instructions to be followed by the general licensee, the estimated calendar-quarter doses associated with each operation, and the bases for the estimates. The submitted information shall demonstrate that performance of the specified operations by an individual untrained in radiological protection, in addition to other handling, storage, and use of devices under the general license, is unlikely to cause that individual to receive a dose in excess of 10 percent of the annual limits specified in part 4 of these regulations.

(e) Each device shall be listed on the nuclear regulatory commission's sealed source and device registry. (Authorized by and implementing K.S.A. 48-1607; effective, T-86-37, Dec. 11, 1985; effective May 1, 1986; amended Dec. 30, 2005; amended May 4, 2018.)

28-35-181i. Special license to manufacture, distribute, assemble, or repair luminous safety devices for use in aircraft.
Each applicant for a specific license to manufacture, assemble, or repair luminous safety devices containing tritium or promethium-147, for use in aircraft, and to distribute these devices to persons generally licensed under K.A.R. 28-35-178d [p.86] shall meet the requirements of 10 C.F.R. 32.53, 32.54, 32.55, and 32.56, as in effect on December 2, 2015, which are hereby adopted by reference, except that wherever the term "commission" appears within the text of the federal regulations adopted by reference in this regulation, that term shall be replaced with the term "department." (Authorized by and implementing K.S.A. 48-1607; effective, T-86-37, Dec. 11, 1985; effective May 1, 1986; amended May 4, 2018.)
28-35-181j. Specific licenses to manufacture and distribute calibration sources containing americium-241 or radium-226. (a) An application for a specific license to manufacture or initially transfer calibration or reference sources containing americium-241 or radium-226 for distribution to persons generally licensed under K.A.R. 28-35-178e [p.86] shall not be approved unless the following requirements are met:

(1) The applicant shall satisfy the general requirements of part 3 of these regulations.

(2) The applicant shall submit sufficient information regarding each type of calibration or reference source pertinent to evaluation of the potential radiation exposure, including the following:

(A) Chemical and physical form and maximum quantity of americium-241 or radium-226 in the source;
(B) details of construction and design;
(C) details of the method of incorporation and binding of the americium-241 or radium-226 in the source;
(D) procedures for and results of prototype testing of sources that are designed to contain more than 0.005 microcurie of americium-241 or radium-226, to demonstrate that the americium-241 or radium-226 contained in each source will not be released or be removed from the source under normal conditions of use;
(E) details of quality control procedures to be followed in manufacture of the source;
(F) description of labeling to be affixed to the source or the storage container for the source; and
(G) any additional information, including experimental studies and tests, required by the department to facilitate a determination of the safety of the source.

(3) Each source shall contain no more than 5 uCi of americium-241 or radium-226.

(4) The method of incorporation and binding of more than 0.005 uCi of the americium-241 or radium-226 in the source shall prevent the release or removal of americium-241 or radium-226 from the source under normal conditions of use and handling of the source.
(5) The applicant shall conduct prototype tests, in the order listed, on each of five prototypes of the source containing more than 0.185 kilobecquerel (0.005 microcurie) of americium-241 or radium-226, and the five prototype sources shall have passed the prototype test, as follows:

(A) Initial measurement. The quantity of radioactive material deposited on the source shall be measured by direct counting of the source.

(B) Dry wipe test. The entire radioactive surface of the source shall be wiped with filter paper with the application of moderate finger pressure. Removal of radioactive material from the source shall be determined by measuring the radioactivity on the filter paper or by direct measurement of the radioactivity on the source following the dry wipe.

(C) Wet wipe test. The entire radioactive surface of the source shall be wiped with filter paper, moistened with water, with the application of moderate finger pressure. Removal of radioactive material from the source shall be determined by measuring the radioactivity on the filter paper after the paper has dried or by direct measurement of the radioactivity on the source following the wet wipe.

(D) Water soak test. The source shall be immersed in water at room temperature for 24 consecutive hours. The source shall then be removed from the water. Removal of radioactive material from the source shall be determined by direct measurement of the radioactivity on the source after the source has dried or by measuring the radioactivity in the residue obtained by evaporation of the water in which the source was immersed.

(E) Dry wipe test. On completion of the water soak test, the dry wipe test described in paragraph (a)(5)(B) shall be repeated.

(F) Observations. Removal of more than 0.005 microcurie of radioactivity in any test prescribed by paragraph (a)(5) shall be cause for rejection of the source design. Results of prototype tests submitted to the nuclear regulatory commission shall be given in terms of radioactivity in microcuries and percent of removal from the total amount of radioactive material deposited on the source.

(6) Each source or storage container for the source shall have a label affixed that contains sufficient information about safe use and storage of the source and includes the following or an equivalent statement:
“The receipt, possession, use and transfer of this source, Model _____, Serial No. _____, are subject to a general license and the regulations of the United States Nuclear Regulatory Commission or of a State with which the commission has entered into an agreement for the exercise of regulatory authority. Do not remove this label.

CAUTION—RADIOACTIVE MATERIAL—THIS SOURCE CONTAINS AMERICIUM-241 (or RADIUM-226). DO NOT TOUCH RADIOACTIVE PORTION OF THIS SOURCE

(Name of manufacturer or initial transferor)”;

(b) Each person licensed under this regulation shall perform a dry wipe test upon each source containing more than 3.7 kilobecquerels (0.1 microcurie) of americium-241 or radium-226 before transferring the source to a general licensee in accordance with K.A.R. 28-35-178e [p.86] or equivalent regulations of an agreement state or the nuclear regulatory commission. This test shall be performed by wiping the entire radioactive surface of the source with a filter paper with the application of moderate finger pressure.

The radioactivity on the paper shall be measured by using radiation detection instrumentation capable of detecting 0.185 kilobecquerel (0.005 microcurie) of americium-241 or radium-226. If this test discloses more than 0.185 kilobecquerel (0.005 microcurie) of radioactive material, the source shall be deemed to be leaking or losing americium-241 or radium-226 and shall not be transferred to a general licensee in accordance with K.A.R. 28-35-178e [p.86] or equivalent regulations of an agreement state or the nuclear regulatory commission. (Authorized by and implementing K.S.A. 48-1607; effective, T-86-37, Dec. 11, 1985; effective May 1, 1986; amended March 18, 2011.)

28-35-181k. Specific licenses to manufacture and distribute ice detection devices. Each applicant for a specific license to manufacture ice detection devices and to distribute those devices to persons generally licensed under K.A.R. 28-35-178g [p.88] shall meet the requirements of 10 C.F.R. 32.61 and 32.62, as in effect on December 2, 2015, which are hereby adopted by reference, except that wherever the term "commission" appears within 10 C.F.R. 32.61, that term shall be replaced with the term
28-35-181l. Specific licenses to manufacture and distribute industrial products and devices containing depleted uranium. (a) An application to manufacture industrial products and devices containing depleted uranium for mass-volume applications and to distribute those products or devices to persons generally licensed under K.A.R. 28-35-177a(c) [p.78] shall not be approved unless all of the following conditions, in addition to all of the applicable requirements specified in these regulations, are met:

(1) The applicant submits sufficient information relating to the design, manufacture, prototype testing, quality control procedures, labeling or marking, proposed uses, and potential hazards of the industrial product or device to provide reasonable assurance that the possession, use, or transfer of the depleted uranium in the product or device is not likely to cause any individual to receive a radiation dose in excess of 10 percent of the limits specified in K.A.R. 28-35-212a [p.192].

(2) The applicant submits sufficient information regarding the industrial product or device and the presence of depleted uranium for a mass-volume application in the product or device to provide reasonable assurance that unique benefits will accrue to the public because of the usefulness of the product or device.

(3) The secretary finds that the product or device combines a high degree of utility with a low probability of uncontrolled disposal or dispersal of significant quantities of depleted uranium into the environment.

(4) The application states clearly the use or uses for which the product or device is intended.

(b) Each person licensed pursuant to subsection (a) of this regulation shall meet the following requirements:

(1) In the manufacture of the industrial product or device and in the installation of the depleted uranium into the product or device, maintain the level of quality control required by the license;

(2) label or mark each unit to meet the following requirements:

(A) Identify the manufacturer of the product or device and the number of the license under which the product or device was
manufactured, identify the fact that the product or device contains depleted uranium, and indicate the quantity of depleted uranium in each product or device; and

(B) state that the receipt, possession, use, and transfer of the product or device are subject to a general license and the regulations issued by the secretary, the U.S. nuclear regulatory commission, or an agreement state;

(3) ensure that the depleted uranium, before being installed in each product or device, has been impressed with the following legend clearly legible through any plating or other covering: "depleted uranium";

(4)(A) Furnish a copy of K.A.R. 28-35-177a [p.76] and a form specified by the department to each person to whom the applicant transfers depleted uranium in a product or device for use pursuant to the general license issued under K.A.R. 28-35-177a(c) [p.78]; or

(B) furnish the following to each person to whom the applicant transfers depleted uranium in a product or device for use pursuant to a general license issued by the U.S. nuclear regulatory commission or an agreement state:

(i) A copy of the regulation of the U.S. nuclear regulatory commission or an agreement state that is equivalent to K.A.R. 28-35-177a(c) [p.78] and a copy of the certificate of the U.S. nuclear regulatory commission or agreement state;

(ii) a copy of K.A.R. 28-35-177a [p.76] and a copy of the form specified by the department; and

(iii) a note explaining that the use of the product or device is regulated by the U.S. nuclear regulatory commission or an agreement state under requirements substantially the same as those in K.A.R. 28-35-177a [p.76];

(5) report to the department all transfers of industrial products or devices to another person for use under the general license specified in K.A.R. 28-35-177a(c) [p.78]. This report shall identify each general licensee by providing the following information:

(A) The name and address;

(B) the name of an individual, by name and position, if any, who shall be a point of contact between the department and the general licensee;
(C) the type and model number of the device transferred; and
(D) the quantity of depleted uranium contained in the
product or device. Each licensee shall submit a report within 30 days
after the end of each calendar quarter. If no transfers have been made
to persons generally licensed under K.A.R. 28-35-177a(c) [p.78] during the reporting period, the report shall indicate this fact;

(6)(A) Report to the U.S. nuclear regulatory commission all
transfers of industrial products or devices to persons for use under a
U.S. nuclear regulatory commission general license that is
equivalent to the license specified in K.A.R. 28-35-177a(c) [p.78];

(B) report to the appropriate state agency of each agreement
state all transfers of devices manufactured and distributed pursuant
to this regulation for use under a general license issued by that
particular agreement state; and

(C) identify the following in each report required under
paragraph (b) (6)(A) or (b) (6)(B):

(i) Each general licensee by name and address;
(ii) the name of an individual, by name and position, if any,
who shall be a point of contact between the commission or state
agency and the general licensee;
(iii) the type and model number of the device transferred;
and
(iv) the quantity of depleted uranium contained in the
product or device.

Each licensee shall submit the report within 30 days after the
end of each calendar quarter. If no transfers are made to U.S. nuclear
regulatory commission licensees during any reporting period, this
information shall be reported to the U.S. nuclear regulatory
commission. If no transfers are made to general licensees within a
particular agreement state during the reporting period, this
information shall be reported to the appropriate agency of the
agreement state;

(7) keep and maintain, for two years, records showing the
name, address, and point of contact for each general licensee to
whom a transfer of depleted uranium in industrial products or
devices has been made, including the date of the transfer and the
quantity of depleted uranium in the product or device transferred; and

(8) keep and maintain, for two years, records showing
compliance with the reporting requirements of this subsection.
28-35-181m. Specific licenses to manufacture, prepare, or distribute radiopharmaceuticals containing radioactive material for medical use. An application for a specific license to manufacture, prepare, or distribute radiopharmaceuticals containing radioactive material and used by persons as specified in part 6 of these regulations shall not be approved unless the applicant meets the requirements of this regulation and all other applicable requirements of these regulations.

(a) Each applicant shall meet the requirements in K.A.R. 28-35-180a [p.96].

(b) Each applicant shall submit evidence of either of the following:

1. The radiopharmaceutical containing radioactive material is subject to the federal food, drug and cosmetic act or the public health service act and will be manufactured, labeled, and packaged in accordance with a new drug application (NDA) approved by the food and drug administration (FDA), a biologic product license issued by the FDA, or a "notice of claimed investigational exemption for a new drug" (IND) accepted by the FDA.

2. The manufacture and distribution of the radiopharmaceutical containing radioactive material is not subject to the federal food, drug, and cosmetic act or the public health service act.

(c) Each applicant shall submit evidence of at least one of the following:

1. The applicant is registered or licensed with the U.S. food and drug administration as a drug manufacturer.

2. The applicant is registered or licensed with a state agency as a drug manufacturer.

3. The applicant is licensed as a pharmacy by the state board of pharmacy.

4. The applicant is operating as a nuclear pharmacy within a federal medical institution.

5. The applicant is operating a positron emission tomography (PET) drug production facility.

(d) Each applicant shall submit the following information on the radionuclide:
(1) The chemical and physical form of the material;
(2) the packaging in which the radionuclide is shipped, including the maximum activity per package; and
(3) evidence that the shielding provided by the packaging of the radioactive material is appropriate for the safe handling and storage of radiopharmaceuticals by group licensees.

(e)(1) Each applicant shall submit a description of the following:
(A) A label that shall be affixed to each transport radiation shield, whether the shield is constructed of lead, glass, plastic, or other material, of a radioactive drug to be transferred for commercial distribution. The label shall include the following:
(i) The radiation symbol and the words "CAUTION — RADIOACTIVE MATERIAL" or "DANGER — RADIOACTIVE MATERIAL";
(ii) the name of the radioactive drug and the abbreviation; and
(iii) the quantity of radioactivity at a specified date and time. For radioactive drugs with a half-life greater than 100 days, the time may be omitted; and
(B) a label that shall be affixed to each syringe, vial, or other container used to hold a radioactive drug to be transferred for commercial distribution. The label shall include the radiation symbol and the words "CAUTION — RADIOACTIVE MATERIAL" or "DANGER — RADIOACTIVE MATERIAL" and an identifier that ensures that the syringe, vial, or other container can be correlated with the information on the transport radiation shield label.

(2) The labels, leaflets, or brochures required by this regulation shall be made in addition to the labeling required by the FDA. The labels, leaflets, or brochures may be separate from the FDA labeling, or with the approval of the FDA, the labeling may be combined with the labeling required by the FDA.

(f) All of the following shall apply to each licensee described in paragraph (c)(3) or (c)(4), or both:
(1) The licensee may prepare radioactive drugs for medical use, if each radioactive drug is prepared by either an authorized nuclear pharmacist, as specified in paragraphs (2) and (4) of this subsection, or an individual under the supervision of an authorized nuclear pharmacist.
(2) The licensee may allow a pharmacist to work as an authorized nuclear pharmacist if at least one of the following conditions is met:

(A) The pharmacist meets the requirements in 10 C.F.R. 35.55(b) and 35.59 as adopted by reference in K.A.R. 28-35-264 [p.291], and the licensee has received an approved license amendment identifying this individual as an authorized nuclear pharmacist.

(B) The pharmacist is designated as an authorized nuclear pharmacist in accordance with paragraph (4) of this subsection.

(3) The actions authorized in paragraphs (1) and (2) of this subsection shall be permitted in spite of more restrictive language in license conditions.

(4) The licensee may designate a pharmacist as an authorized nuclear pharmacist if at least one of the following conditions is met:

(A) The individual was a nuclear pharmacist preparing only radioactive drugs containing accelerator-produced radioactive material.

(B) The individual practiced at a government agency or federally recognized Indian tribe pharmacy before November 30, 2007 or at any other pharmacy before August 8, 2009.

(5) Each licensee shall provide a copy of the state pharmacy license or registration for an individual to work as an authorized nuclear pharmacist and one of the following documents to the department:

(A) The individual's certification by a specialty board whose certification process has been recognized as specified in 10 C.F.R. 35.55(a), as adopted by reference in K.A.R. 28-35-264 [p.291];

(B) a department, NRC, or agreement state license listing the individual as an authorized nuclear pharmacist;

(C) an NRC master materials licensee permit listing the individual as an authorized nuclear pharmacist;

(D) a permit issued by a licensee of broad scope or an NRC master materials permittee or the authorization from a commercial nuclear pharmacy that is authorized to list its own authorized nuclear pharmacist; or

(E) documentation that only accelerator-produced radioactive materials were used in the practice of nuclear pharmacy at a government agency or federally recognized Indian tribe before November 30, 2007 or at all other locations of use before August 8,
(g) Each licensee shall possess and use instrumentation to
measure the radioactivity of radioactive drugs. Each licensee shall
have procedures for using the instrumentation. Each licensee shall
measure, by direct measurement or by combination of
measurements and calculations, the amount of radioactivity in
dosages of alpha-, beta-, or photon-emitting radioactive drugs
before transfer for commercial distribution. Each licensee shall meet
the following requirements:

(1) Perform tests before initial use, periodically, and
following repair on each instrument for accuracy, linearity, and
graphy dependence, as appropriate for the use of the instrument,
and make adjustments if necessary; and

(2) check each instrument for constancy and proper
operation at the beginning of each day of use.

(h) Each application from a medical facility, an educational
institution, or a federal facility to produce positron emission
tomography (PET) radioactive drugs for noncommercial transfer to
licensees within the applicant's consortium authorized for medical
use under part 6 of these regulations or equivalent agreement state
requirements shall include the following:

(1) A request for authorization for the production of PET
radionuclides or evidence of an existing license issued under these
regulations or equivalent NRC or agreement state requirements for
a PET radionuclide production facility within the applicant's
gonsortium from which the applicant receives PET radionuclides;

(2) evidence that the applicant is qualified to produce
radioactive drugs for medical use by meeting the requirements of
this regulation;

(3) the name of each individual authorized to prepare PET
radioactive drugs if the applicant is a pharmacy and documentation
that each individual meets the requirements of an authorized nuclear
pharmacist; and

(4) the name of each PET radioactive drug for production
and noncommercial distribution to the applicant's consortium,
including the chemical and physical form of each drug.

(i) Nothing in these regulations shall exempt the licensee
from the requirement to comply with applicable FDA requirements
and other federal and state requirements governing radioactive

28-35-181n. Specific licenses to manufacture and distribute generators or reagent kits for preparation of radiopharmaceuticals containing radioactive material. Each application for a specific license to manufacture and distribute generators or reagent kits containing radioactive material for preparation of radiopharmaceuticals by persons licensed as specified in K.A.R. 28-35-181d [p.106] for the uses listed in group III shall meet the requirements of subsections (a), (b), (c), and (d).

(a) Each applicant shall meet the general requirements specified in K.A.R. 28-35-180a [p.96].

(b) Each applicant shall submit documentation of one of the following:

(1) The generator or reagent kit is subject to the federal food, drug and cosmetic act or the public health service act and will be manufactured, labeled, and packaged in accordance with a new drug application (NDA) approved by the food and drug administration (FDA), a biologic product license issued by FDA, or a "notice of claimed investigational exemption for a new drug" (IND) accepted by FDA.

(2) The manufacture and distribution of the generator or reagent kit is not subject to the federal food, drug, and cosmetic act and the public health service act.

(c) Each applicant shall submit information on the following:

(1) The radionuclide;

(2) the chemical and physical form of the material;

(3) packaging, including maximum activity per package; and

(4) shielding provided by the packaging of the radioactive material contained in the generator or reagent kit.

(d) The label affixed to the generator or reagent kit shall contain information on the radionuclide, quantity, and date of assay.

(e) The label affixed to the generator or reagent kit, or the leaflet or brochure that accompanies the generator or reagent kit, shall contain the following:
(1) Adequate information, from a radiation safety standpoint, on the procedures to be followed and the equipment and shielding to be used in eluting the generator or processing radioactive material with the reagent kit; and

(2) a statement that "this generator or reagent kit, as appropriate, is approved for use by persons licensed by the department according to K.A.R. 28-35-181d [p.106] for group III uses, or under equivalent licenses of the United States nuclear regulatory commission or another agreement state." The labels, leaflets, or brochures required by this paragraph shall be in addition to the labeling required by the FDA. The labels, leaflets, or brochures may be separate from FDA labeling, or with the approval of FDA, the labeling may be combined with the labeling required by the FDA. (Authorized by and implementing K.S.A. 48-1607; effective, T-86-37, Dec. 11, 1985; effective May 1, 1986; amended July 27, 2007.)

28-35-181o. Specific licenses to manufacture and distribute sources and devices for use as a calibration, transmission, or reference source or for certain medical uses. (a) Each application for a specific license to manufacture and distribute sources and devices containing radioactive material to persons licensed as specified in K.A.R. 28-35-181d [p.106] for use as a calibration, transmission, or reference source or for one or more of the uses listed in 10 C.F.R. 35.400, 35.500, 35.600, and 35.1000, as adopted by reference in K.A.R. 28-35-264 [p.291], shall include the following information regarding each type of source or device:

(1) The radioactive material contained, its chemical and physical form, and amount;

(2) details of design and construction of the source or device;

(3) procedures for, and results of, prototype tests to demonstrate that the source or device will maintain its integrity under stresses likely to be encountered in normal use and in accidents;

(4) for devices containing radioactive material, the radiation profile for a prototype device;

(5) details of quality control procedures to ensure that the production sources and devices meet the standards of the design and prototype tests;
(6) procedures and standards for calibrating sources and devices;

(7) legend and methods for labeling sources and devices as to their radioactive content;

(8) radiation safety instructions for handling and storing the source or device. These instructions shall be included on a durable label attached to the source or device. However, instructions that are too lengthy for the label may be summarized on the label and printed in detail on a brochure that is referenced on the label;

(9) the label that is to be affixed to the source or device or to the permanent storage container for the source or device. The label shall contain information on the radionuclide, quantity, and date of assay, and a statement that the source or device is licensed by the department for distribution to persons licensed under K.A.R. 28-35-181d [p.106] or under an equivalent license of the nuclear regulatory commission (NRC) or an agreement state. Labeling for sources that do not require long-term storage may be on a leaflet or brochure that is to accompany the source; and

(10) documentation that the source or device is listed on the nuclear regulatory commission's sealed source and device registry.

(b)(1) If the applicant wants to have the source or device required to be tested for leakage of radioactive material at intervals longer than six months, the applicant shall include in the application sufficient information to demonstrate that the longer interval is justified by performance characteristics of the source or device, or similar sources or devices, and by design features that have a significant bearing on the probability or consequences of leakage of radioactive material from the source.

(2) In determining the acceptable interval between tests for leakage of radioactive material, information that includes the following shall be considered by the secretary:

(A) The nature of the primary containment;

(B) the method for protection of the primary containment;

(C) the method of sealing the containment;

(D) containment construction materials;

(E) the form of the contained radioactive material;

(F) the maximum temperature withstood during prototype tests;

(G) the maximum pressure withstood during prototype tests;
28-35-181p. Specific license to manufacture or distribute radioactive material for use by persons generally licensed under K.A.R. 28-35-178h [p.89]. An application for a specific license to manufacture or distribute, or to manufacture and distribute radioactive material for use by persons generally licensed under K.A.R. 28-35-178h [p.89], shall not be approved unless the applicant meets the requirements of subsections (a),(b),(c), and (d) of this regulation.

(a) The radioactive material shall be prepared for distribution in prepackaged units of:
   1. iodine-125 in units not exceeding 10 microcuries each;
   2. iodine-131 in units not exceeding 10 microcuries each;
   3. carbon-14 in units not exceeding 10 microcuries each;
   4. hydrogen-3 (tritium) in units not exceeding 50 microcuries each;
   5. iron-59 in units not exceeding 20 microcuries each;
   6. selenium-75 in units not exceeding 10 microcuries each;
   7. mock iodine-125 in units not exceeding 0.05 microcuries of iodine-129 and 0.005 microcuries of americium-241; or
   8. cobalt-57 in units not exceeding 10 microcuries each.

(b) Each prepackaged unit shall bear a durable clearly visible label:
   1. identifying the radioactive contents as to chemical form and radionuclide, and indicating that the amount of radioactivity does not exceed:
      (A) 10 microcuries of iodine-125, iodine-131, carbon-14, cobalt-57, or selenium-75;
      (B) 50 microcuries of hydrogen-3 (tritium);
      (C) 20 microcuries of iron-59; or
      (D) 0.05 microcurie of iodine-129 and 0.005 microcurie of americium-241 each; and
(2) Displaying the radiation caution symbol described in K.A.R. 28-35-219a [p.212] and the words, "CAUTION—RADIOACTIVE MATERIAL", and "not for internal or external use in humans or animals".

(c) The following statement, or a substantially similar statement, shall appear on a label affixed to each prepackaged unit, or in a leaflet or brochure to accompany the package:

“The radioactive material may be received, acquired, possessed, and used only by physicians, clinical laboratories or hospitals and only for in vitro clinical or laboratory tests not involving internal or external administration of the material or the radiation therefrom, to human beings or animals. Its receipt, acquisition, possession, use, and transfer are subject to the regulations and a general license of the United States nuclear regulatory commission or of a state with which the commission has entered into an agreement for the exercise of regulatory authority.

Name of manufacturer”

(d) The label to be affixed to the unit, or a leaflet or brochure which is to accompany the package, shall contain information concerning the precautions to be observed in handling and storing the radioactive material and regarding the waste disposal requirements of K.A.R. 28-35-223a [p.225]. (Authorized by and implementing K.S.A. 1984 Supp. 48-1607; effective, T-86-37, Dec. 11, 1985; effective May 1, 1986.)

28-35-181q. Special licenses concerning gas and aerosol detectors containing radioactive material other than by-product, source or special nuclear material. (a) An application for a specific license to manufacture, process, produce or transfer gas and aerosol detectors which contain radioactive material other than source, by-product, or special nuclear material, and which are designed to protect life or property from fires and airborne hazards, shall not be approved unless the applicant submits the information required by the United States nuclear regulatory commission under 10 CFR sections 32.26 and 32.27, as in effect on March 31, 1983, for similar devices containing by-product material.
(b) Each person issued a license under subsection (a) of this regulation shall:

(1) develop and carry out adequate control procedures in the manufacture of the product to assure that each production lot meets quality control standards approved by the department;

(2) agree to label or mark each unit so that the manufacturer of the product and the radioactive material in the product can be identified and provide other information with each unit that may be required by the department, including disposal instruction when appropriate; and

(3) agree to file an annual report with the department, which shall include the following information on products imported for sale or distribution or transferred to other persons for use under K.A.R. 28-35-192a [p.150] or an equivalent regulation of the United States nuclear regulatory commission or an agreement state:

(A) A description or identification of the type of each product imported or transferred;

(B) for each radionuclide in each type of product, the total quantity of the radionuclide imported or transferred; and

(C) the number of units of each type of product imported or transferred during the reporting period. If no imports or transfers of radioactive material have been made during a reporting period, the report shall so indicate.

(c) The report required by paragraph (3) of subsection (b) of this regulation shall cover the 12-month period commencing on July 1, and ending on June 30, and shall be filed by July 31 of each year. (Authorized by and implementing K.S.A. 1984 Supp. 48-1607; effective, T-86-37, Dec. 11, 1985; effective May 1, 1986.)

28-35-181r. Special licenses to manufacture, process, import, distribute or transfer certain radioactive material to persons exempt from regulation pursuant to K.A.R. 28-35-192a [p.150]. (a) An application for a specific license to manufacture, process, produce, import, package, repackage, or transfer quantities of radioactive material other than source, byproduct, or special nuclear material for commercial distribution to persons exempt from these regulations pursuant to K.A.R. 28-35-192a [p.150] or an equivalent regulation of the United States nuclear regulatory commission or an agreement state shall not be approved
unless the applicant submits the information required in 10 CFR sections 32.18 and 32.19, as in effect on March 31, 1983.

(b) Each person licensed under subsection (a) of this regulation shall maintain records identifying, by name and address, each person to whom the licensee transfers radioactive material and stating the kinds and quantities of radioactive material transferred. An annual summary report stating the total quantity of each isotope transferred shall be filed with the department. Each report shall cover the 12-month period commencing on July 1 and ending June 30 and shall be filed by July 31 of each year. If no transfers of radioactive material have been made during a reporting period, the report shall indicate this fact. (Authorized by and implementing K.S.A. 1984 Supp. 48-1607; effective, T-86-37, Dec. 11, 1985; effective May 1, 1986.)

28-35-181s. Specific licenses for well logging. Each application for a specific license for the use of licensed material in well logging shall be considered for approval only if the application contains the following:

(a) A description of the training program for logging supervisors and logging assistants that includes the following:
(1) The content of and method for initial training;
(2) on-the-job training;
(3) annual safety reviews provided by the licensee;
(4) the means that the applicant will use to demonstrate the logging supervisor's knowledge and understanding of and ability to comply with these regulations, the license conditions, and the applicant's operating and emergency procedures; and
(5) the means that the applicant will use to demonstrate the logging assistant's knowledge and understanding of and ability to comply with the applicant's operating and emergency procedures;

(b) a copy of the written operating and emergency procedures required by K.A.R. 28-35-383 or an outline or a summary of the procedures that includes the radiation safety aspects;

(c) a description of the program, which shall include records, for annual inspections of the job performance of each logging supervisor to ensure that these regulations, the license conditions, and the applicant's operating and emergency procedures are
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followed. The inspection records shall be retained for three years after each annual internal inspection;

(d) a description of the applicant's overall organizational structure as it applies to the radiation safety responsibilities in well logging, including any delegation of authority and responsibility; and

(e) the manufacturer's name and model numbers of the leak test kits to be used, if an applicant desires to perform leak testing of the sealed sources. If the applicant desires to analyze the applicant's own wipe samples, the application shall include a copy of the procedures to be followed. The procedures shall include the following:

(1) The instruments to be used;
(2) the methods of performing the analysis; and
(3) the applicable experience of the person who will analyze the wipe samples. (Authorized by and implementing K.S.A. 48-1607; effective Dec. 30, 2005.)

28-35-181t. Requirements for license to initially transfer source material for use under the small quantities of source material general license. (a) Each person submitting an application for a specific license to initially transfer source material for use in accordance with K.A.R. 28-35-177a [p.76], or equivalent regulations of an agreement state or the nuclear regulatory commission (NRC), shall meet the following requirements:

(1) Meet the general requirements specified in K.A.R. 28-35-190a [p.148]; and
(2) provide information documenting that the NRC approves the methods for quality control, labeling, and providing safety instructions to recipients.

(b) Each person licensed under this regulation shall meet the following requirements:

(1) Label the immediate container of each quantity of source material with the type of source material, the quantity of source material, and the words "radioactive material";
(2) ensure that the quantities and concentrations of source material are labeled and indicated in any transfer records;
(3) provide the following information to each person to whom source material is transferred for use under K.A.R. 28-35-177a [p.76] or equivalent regulations of an agreement state or the
NRC before the source material is transferred for the first time in each calendar year to each person:

(A) A copy of K.A.R. 28-35-177a [p.76] and K.A.R. 28-35-190a [p.148] or relevant equivalent regulations of an agreement state or the NRC; and

(B) appropriate radiation safety precautions and instructions relating to the handling, use, storage, and disposal of the material;

(4) report transfers as follows, on or before January 31 of each year covering all transfers for the previous calendar year:

(A) File a report with the department. The report shall include the following information:

(i) The name, address, and license number of the person who transferred the source material;

(ii) the name and address of the general licensee to whom source material is distributed, a responsible agent by name or position, or both, the phone number of the general licensee to whom the material was sent, and the type, physical form, and quantity of source material transferred; and

(iii) the total quantity of each type and physical form of source material transferred in the reporting period to all generally licensed recipients; and

(B) file a report with each agreement state or the NRC if the transfer is to a person licensed by the NRC that identifies all persons operating under provisions equivalent to K.A.R. 28-35-177a [p.76] to whom more than 50 grams (0.11 lb) of source material has been transferred within a single calendar quarter. The report shall include the following information:

(i) The name, address, and license number of the person who transferred the source material;

(ii) the name and address of the general licensee to whom source material was distributed, a responsible agent by name or position, or both, the phone number of the general licensee to whom the material was sent, and the type, physical form, and quantity of source material transferred; and

(iii) the total quantity of each type and physical form of source material transferred in the reporting period to each generally licensed recipient within the agreement state; and

(5) maintain all information that supports the reports required by this subsection concerning each transfer to a general
licensee for one year after the transfer is included in a report to the NRC or to an agreement state.

(c) If no transfers were made to any person generally licensed under K.A.R. 28-35-177a [p.76], under an equivalent agreement state, or under NRC provisions during the period specified in paragraph (B)(4) of this regulation, a report shall be submitted to the NRC indicating that no transfers were made. If no transfers have been made to any general licensee in a particular agreement state during the reporting period, this information shall be reported to the agreement state upon request of the agency.

(Authorized by and implementing K.S.A. 48-1607; effective May 4, 2018.)


28-35-182a. Specific licenses of broad scope; types of specific licenses. (a) A "type A specific license of broad scope" is a specific license which is issued to a person who meets the requirements of K.A.R. 28-35-182b [p.137] and which authorizes that person to acquire, own, possess, use and transfer radioactive material in a quantity not exceeding the quantity specified in the license.

(b)(1) A "type B specific license of broad scope" is a specific license issued to a person who meets the requirements of K.A.R. 28-35-182c [p.138] and which authorizes that person to acquire, own, possess, use and transfer a specified amount of one or more of the radionuclides listed in K.A.R. 28-35-200a [p.170].

(2) If only one radionuclide is acquired, owned, possessed, used and transferred, the quantity allowed under a type B specific license of broad scope shall be the quantity specified in column I of K.A.R. 28-35-200a [p.170].

(3) If two or more radionuclides are acquired, owned, possessed, used and transferred, the quantity of all the radionuclides allowed shall be determined as follows:

(A) Determine the ratio of the quantity of each radionuclide to the quantity of that radionuclide specified in column I of K.A.R. 28-35-200a [p.170].

(B) Add the ratios.

(C) The sum of those ratios shall not exceed unity.
(c)(1) A "type C specific license of broad scope" is a specific license which is issued to a person who meets the requirements of K.A.R. 28-35-182d [p.139] and which authorizes that person to acquire, own, possess, use and transfer a specified amount of one or more of the radionuclides listed in K.A.R. 28-35-200a [p.170].

(2) If only one radionuclide is acquired, owned, possessed, used and transferred, the quantity allowed under a type C specific license of broad scope shall be the quantity specified in column II of K.A.R. 28-35-200a [p.170].

(3) If two or more radionuclides are acquired, owned, possessed, used and transferred, the quantity of all radionuclides allowed shall be determined as follows:
   (A) Determine the ratio of the quantity of each radionuclide to the quantity of that radionuclide specified in column II of K.A.R. 28-35-200a [p.170].
   (B) Add the ratios.
   (C) The sum of the ratios shall not exceed unity. (Authorized by and implementing K.S.A. 1984 Supp. 48-1607; effective, T-86-37, Dec. 11, 1985; effective May 1, 1986.)

28-35-182b. Qualifications for a type A specific license of broad scope. A type A specific license of broad scope shall be issued only to an applicant who:

(a) has previously engaged in activities involving the use of radioactive materials. The applicant shall submit a summary of the previous activities that involved the use of radioactive materials; and

(b) has established administrative controls and provisions relating to organization and management, procedures, record-keeping, material control and accounting, and management review to assure safe operations. These controls shall include:

   (1) The establishment of a radiation safety committee composed of a radiation safety officer, a representative of management, and persons trained and experienced in the safe use of radioactive material;

   (2) the appointment of a radiation safety officer who is qualified by training and experience in radiation protection, and who is available for advice and assistance on radiation safety matters; and
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(3) the establishment of appropriate administrative procedures. These procedures shall assure that:

(A) the procurement and use of radioactive material is controlled;
(B) safety evaluations of proposed uses of radioactive material are completed. These evaluations shall take into consideration the adequacy of facilities and equipment, training and experience of the user, and proper operating or handling procedures; and
(C) prior to the use of the radioactive material, the safety evaluation of proposed uses, prepared in accordance with paragraph (3)(B) of this subsection, is reviewed, approved and recorded by the radiation safety committee. (Authorized by and implementing K.S.A. 1984 Supp. 48-1607; effective, T-86-37, Dec. 11, 1985; effective May 1, 1986.)

28-35-182c. Qualifications for a type B specific license of broad scope. A type B specific license of broad scope shall be issued only to an applicant who has established controls and provisions relating to organization and management, procedures, recordkeeping, material control and accounting, and management review that are sufficient to ensure safe operation. These controls and provisions shall include the following:

(a) The appointment of a radiation safety officer who is qualified by training and experience in radiation protection and who is available for advice and assistance on radiation safety matters; and

(b) the establishment of appropriate administrative procedures. These procedures shall ensure that all of the following conditions are met:

(1) The procurement and use of radioactive material are controlled.
(2) Safety evaluations of proposed uses of radioactive material are completed. These evaluations shall take into consideration the adequacy of facilities and equipment, training and experience of the user, and proper operating or handling procedures.
(3) Before use of the radioactive material, the safety evaluation of proposed uses, prepared in accordance with paragraph (b)(2), is reviewed, approved, and recorded by the radiation safety officer. (Authorized by and implementing K.S.A. 48-1607;
28-35-182d. Qualifications for a type C specific license of broad scope. A type C specific license of broad scope shall be issued only to an applicant who:

(a) submits a statement that radioactive material will only be used by, or under the direct supervision of, an individual or individuals who have:

(1) at least a bachelor's degree or equivalent training and experience in a physical or biological science or in engineering; and

(2) at least 40 hours of training and experience in the safe handling of radioactive materials, and in the characteristics of ionizing radiation, units of radiation dose and quantities, radiation detection instrumentation, and biological hazards of exposure to radiation. Such training and experience shall be appropriate to the type and forms of radioactive material to be used; and

(b) has established administrative controls and provisions relating to procurement of radioactive materials, procedures, record-keeping, material control and accounting, and management review to assure safe operations. These control provisions shall include appropriate administrative procedures which assure that:

(1) procurement and use of radioactive material is controlled; and

(2) safety evaluations of proposed uses of radioactive material are completed. Such evaluations shall take into consideration the adequacy of facilities and equipment and proper operating or handling procedures. (Authorized by and implementing K.S.A. 1984 Supp. 48-1607; effective, T-86-37, Dec. 11, 1985; effective May 1, 1986.)

28-35-182e. Restrictions on specific licenses of broad scope. (a) Any person who has been issued any type of specific license of broad scope shall not:

(1) Conduct tracer studies in the environment involving direct release of radioactive material;

(2) receive, acquire, own, possess, use, or transfer devices containing 100,000 curies or more of radioactive material as sealed sources used for irradiation of materials;
(3) conduct activities for which a particular specific license is required; or

(4) add, or cause the addition of, radioactive material to any food, beverage, cosmetic, drug, or other product designed for ingestion or inhalation by, or application to, a human being.

(b) Any radionuclide or radionuclides possessed under a type A specific license of broad scope shall be only used by, or under the direct supervision of, a person or persons approved by a licensee's radiation safety committee.

(c) Any radionuclide or radionuclides possessed under a type B specific license of broad scope shall be only used by, or under the direct supervision of, a person or persons approved by a licensee's radiological safety officer.

(d) Any radionuclide or radionuclides possessed under a type C specific license of broad scope shall be used only by, or under the direct supervision of, a person or persons who meet the requirements of K.A.R. 28-35-182d(a) [p.139]. (Authorized by and implementing K.S.A. 1984 Supp. 48-1607; effective, T-86-37, Dec. 11, 1985; effective May 1, 1986.)


28-35-183a. Conditions imposed upon any specific license. (a) Upon determining that an application meets the requirements of the act and these regulations, the secretary shall issue a specific license authorizing the activity proposed by the applicant and may impose any limitations or conditions to the specific license as the secretary deems appropriate or necessary.

(b) The secretary may incorporate in any license, at the time of its issuance or thereafter, any requirements and conditions with respect to the licensee's receipt, possession, use, or transfer of radioactive material as the secretary deems appropriate or necessary in order to:

(1) Protect health or to minimize danger to life and property;

(2) assure the proper reporting, record-keeping and inspection of activities by the licensee; and
(3) prevent loss or theft of material subject to these regulations. (Authorized by and implementing K.S.A. 1984 Supp. 48-1607; effective, T-86-37, Dec. 11, 1985; effective May 1, 1986.)


28-35-184a. Specific conditions on all licenses. (a) No license and no right under any license shall be assigned or otherwise transferred except as authorized under the act or these regulations and approved by the secretary in writing. Each request to assign or transfer a license shall include the following:

(1) The name and the technical and financial qualifications of the proposed transferee; and

(2) the financial assurance for decommissioning information required by K.A.R. 28-35-180b [p.98].

(b) Each person authorized under these regulations shall confine the use and possession of the radioactive material licensed to the locations and purposes authorized in the license.

(c) No person shall introduce radioactive material into any product or material knowing or having reason to believe that the product or material will be transferred to a person exempt from these regulations under K.A.R. 28-35-192a, 28-35-192b, 28-35-192c, 28-35-192e, 28-35-192f, or 28-35-192g [p.150 – p.157] or the equivalent regulations of the nuclear regulatory commission (NRC) or an agreement state, except in accordance with a specific license issued under K.A.R. 28-35-181f [p.110] or the general license issued under K.A.R. 28-35-194a [p.159].

(d) Each licensee shall file written notice with the secretary 30 days before vacating any facility when the licensee decides to permanently discontinue all activities involving licensed materials authorized in that facility under the license.

(e) Each licensee authorized under K.A.R. 28-35-181h [p.113] to distribute devices to generally licensed persons shall perform the following:

(1) Report to the department all sales or transfers of those devices to persons generally licensed under K.A.R. 28-35-178b [p.80]. The report shall identify each general licensee by name and
address, the type of device transferred, and the quantity and type of radioactive material contained in the device. A report shall be submitted within 90 days of the sale or transfer; and

(2) furnish, to each general licensee to whom the licensee transfers any such device, a copy of the general license issued under K.A.R. 28-35-178b [p.80].

(f)(1) Each general licensee that is required by this part to register and each specific licensee shall notify the department, in writing, immediately following the filing of a voluntary or involuntary petition for bankruptcy under any chapter of title 11, bankruptcy, of the United States code by or against any of the following:

(A) The licensee;
(B) any person controlling the licensee or listing the license or licensee as property of the estate; or
(C) any affiliate of the licensee.

(2) The notification specified in paragraph (f)(1) shall indicate the following:

(A) The name of the bankruptcy court in which the petition for bankruptcy was filed; and
(B) the date of the filing of the petition.

(g) Each portable gauge licensee shall use at least two independent physical controls that form tangible barriers to secure each portable gauge from unauthorized removal whenever the portable gauge is not under the control and constant surveillance of the licensee. (Authorized by and implementing K.S.A. 48-1607; effective, T-86-37, Dec. 11, 1985; effective May 1, 1986; amended Dec. 30, 2005; amended July 27, 2007; amended May 4, 2018.)

28-35-184b. Reporting requirements. (a) Immediate report. Each licensee shall notify the department as soon as possible but not later than four hours after the discovery of any of the following types of events:

(1) An event that prevents immediate protective actions necessary to avoid exposures to radiation or radioactive materials that could exceed regulatory limits; or

(2) an event involving a release of licensed material that could exceed regulatory limits.
(b) Twenty-four hour report. Each licensee shall notify the department within 24 hours after the discovery of any of the following events involving licensed material:

(1) An unplanned contamination event in which the following conditions are met:
   (A) Access to the contaminated area, by workers or the public, is restricted for more than 24 hours by imposing additional radiological controls or by prohibiting entry into the area;
   (B) the quantity of material involved is greater than five times the lowest annual limit on intake specified for the material in appendix B of the "Appendices to part 4: standards for protection against radiation," effective April 1994; and
   (C) access to the area is restricted for a reason other than to allow isotopes with a half-life of less than 24 hours to decay before decontamination;

(2) an event in which equipment is disabled or fails to function as designed when the following conditions are met:
   (A) The equipment is required by regulation or license condition to prevent releases exceeding regulatory limits, to prevent exposures to radiation and radioactive materials exceeding regulatory limits, or to mitigate the consequences of an accident;
   (B) the equipment is required to be available and operable at the time the equipment is disabled or fails to function; and
   (C) no redundant equipment is available and operable to perform the required safety function;

(3) an event that requires unplanned medical treatment at a medical facility of an individual with spreadable radioactive contamination on the individual or the individual's clothing; and

(4) an unplanned fire or explosion damaging any licensed material or any device, container, or equipment containing licensed material when the following conditions are met:
   (A) The quantity of material involved is greater than five times the lowest annual limit of intake specified for the material in appendix B of the "appendices to part 4: standards for protection against radiation," effective April 1994; and
   (B) the damage affects the integrity of the licensed material or its container.
(c) Preparation and submission of reports. Each report made by a licensee submitting reports in response to the requirements of this regulation shall meet the following requirements:

(1) Each licensee shall submit the reports required by subsections (a) and (b) of this regulation by telephone to the Kansas department of health and environment, bureau of air and radiation, radiation control program. Each report shall include the following information, to extent it is available.

(A) The caller's name and a callback number;
(B) a description of the event, including the date and time;
(C) the exact location of the event;
(D) the isotopes, quantities, and chemical and physical forms of the licensed material involved; and
(E) any personnel radiation exposure data available.

(2) Each licensee submitting any report required by subsection (a) or (b) of this regulation shall submit a written follow-up report within 30 days of each initial report. A written report submitted pursuant to other requirements of these regulations shall be considered to fulfill this requirement if the report contains all of the information required by this paragraph. The report shall include the following:

(A) A description of the event, including the probable cause, and the name of the manufacturer and the model number, if applicable, of any equipment that failed or malfunctioned;
(B) a description of the exact location of the event;
(C) the isotopes, quantity, and chemical and physical form of the licensed material involved;
(D) the date and time of the event;
(E) a description of the corrective actions taken or planned and the results of any evaluations or assessments; and
(F) a description of the extent to which individuals were exposed to radiation or to radioactive materials, without identifying any individuals by name. (Authorized by and implementing K.S.A. 48-1607; effective Nov. 1, 1996; amended Dec. 30, 2005.)

28-35-185a. Expiration of licenses. (a) Except as provided in K.A.R. 28-35-186a(b) [p.145], each specific license shall expire at end of the day, in the month and year stated on the license.
(b) With respect to the possession of radioactive material and residual radioactive contamination, each specific license shall continue in effect beyond the expiration date until the department has notified the licensee, in writing, that the license is terminated, even if any of the following occurs:
(1) The licensee decides not to renew the license.
(2) No application for license renewal is submitted.
(3) An application for renewal is denied.
(4) The department modifies or suspends a license.
(c) After the expiration date specified in the license, each licensee to whom this regulation applies who possesses radioactive material, including residual radioactive material, shall meet the following requirements:
(1) Limit the licensee's actions involving radioactive material to those related to decommissioning; and


28-35-186a. Renewal of licenses. (a) Each application for the renewal of a specific license shall be filed in accordance with K.A.R 28-35-179a.
(b) When a licensee, not less than 30 days prior to the expiration of the licensee's existing license, has filed an application in proper form for renewal of the existing license, the existing license shall not expire until final action on the application has been made by the secretary. (Authorized by and implementing K.S.A. 1984 Supp. 48-1607; effective, T-86-37, Dec. 11, 1985; effective May 1, 1986.)
28-35-187a. Amendment of licenses at request of licensee. Each application for the amendment of an existing license shall be filed in accordance with K.A.R. 28-35-179a and shall specify the respects in which the licensee desires the license to be amended and the grounds for the amendment. (Authorized by and implementing K.S.A. 1984 Supp. 48-1607; effective, T-86-37, Dec. 11, 1985; effective May 1, 1986.)

28-35-188a. Department action on application to renew or amend. In considering whether to grant or deny an application to renew an existing license, the secretary shall apply the criteria which are applied to determine whether an initial license should be granted or denied. (Authorized by and implementing K.S.A. 1984 Supp. 48-1607; effective, T-86-37, Dec. 11, 1985; effective May 1, 1986.)

28-35-189a. Advance notification of transport of nuclear waste. (a) Prior to the transport of any nuclear waste outside the confines of the licensee's facility or any other place of use or storage, or prior to the delivery of any nuclear waste to a carrier for transport, each licensee shall provide advance notification of such transport to the governor, or the governor's designee, of each state through which the waste will be transported. For the purpose of this regulation, "nuclear waste" means any large quantity of source, by-product, or special nuclear material required to be in type B packaging while transported to, through, or across state boundaries to a disposal site, or to a collection point for transport to a disposal site.

(b) Each advance notification required by this regulation shall contain the following information:
   (1) the name, address, and telephone number of the shipper, carrier and receiver of the shipment;
(2) a description of the nuclear waste contained in the shipment as required by regulation of the U.S. department of transportation 49 CFR 172.202 and 172.203(d), as in effect July 1, 1984;

(3) the point of origin of the shipment and the seven day period during which departure of the shipment is estimated to occur;

(4) the seven day period during which arrival of the shipment at state boundaries is estimated to occur;

(5) the destination of the shipment, and the seven day period during which arrival of the shipment is estimated to occur; and

(6) a point of contact with a telephone number for current shipment information.

(c) The notification required by this regulation shall be made in writing to the office of each appropriate governor or the governor's designee and to the Kansas department of health and environment. A notification delivered by mail shall be postmarked at least seven days before the beginning of the seven day period during which departure of the shipment is estimated to occur. A notification delivered by messenger shall reach the office of each governor, or the governor's designee, at least four days before the beginning of the seven day period during which departure of the shipment is estimated to occur. A copy of the notification shall be retained by the licensee for one year.

(d) The licensee shall notify each appropriate governor, or the governor's designee, and the Kansas department of health and environment of any changes to the schedule information provided pursuant to this regulation. Such notification shall be by telephone to a responsible individual in the office of each appropriate governor, or to the governor's designee. The licensee shall maintain for one year a record of the name of the individual contracted.

(e) Each licensee who cancels a nuclear waste shipment for which advance notification has been sent shall send a cancellation notice to the governor, or the governor's designee, of each appropriate state and to the Kansas department of health and environment. A copy of the notice shall be retained by the licensee for one year.

(f) A list of the mailing addresses of each governor and each designee is available upon request from the director, office of state programs, U.S. nuclear regulatory commission, Washington, D.C.
28-35-190a. Transfer of material. (a) A licensee shall not transfer radioactive material except as authorized in this regulation.

(b) Any licensee may transfer radioactive material, subject to the acceptance of the transferee:
   (1) To the department;
   (2) to the United States nuclear regulatory commission or its successor;
   (3) to any person exempt from these regulations under K.A.R. 28-35-192a, 28-35-192b, 28-35-192c, 28-35-192d, 28-35-192e, 28-35-192f and 28-35-192g [p.150-157], as permitted under those regulations;
   (4) to any person authorized to receive the material under an appropriate general or specific license issued by the secretary, the United States nuclear regulatory commission or an agreement state, or to any person otherwise authorized to receive the material by the federal government or any agency thereof, the secretary or an agreement state; or
   (5) as otherwise authorized in writing by the secretary; or
   (6) to the U.S. department of energy.

(c) Before transferring radioactive material to a specific licensee or to a general licensee who is required to register with the department, the United States nuclear regulatory commission, or an agreement state, the licensee transferring the material shall verify that the transferee's license authorizes receipt of the type, form, and quantity of radioactive material to be transferred.

(d) The following methods for the verification required by subsection (c) shall be acceptable.
   (1) The transferor may obtain, and read, a current copy of the transferee's specific license or registration certificate.
   (2) The transferor may obtain a written certification by the transferee that the transferee is authorized by license or registration certificate to receive the type, form, and quantity of radioactive
material to be transferred, specifying the license or registration certificate number, issuing agency, and expiration date;

(3) For emergency shipments, the transferor may accept oral certification by the transferee that the transferee is authorized by license or registration certificate to receive the type, form, and quantity of radioactive material to be transferred. The oral certification shall include the license or registration certificate number, the issuing agency, and expiration date. The oral certification shall be confirmed in writing within 10 days following the oral certification.

(4) The transferor may obtain other sources of information compiled by a reporting service from official records of the department, United States nuclear regulatory commission, or an agreement state as to the identity of licensees and the scope and expiration dates of licenses and registration.

(5) When none of the methods of verification described in paragraphs (1) to (4) are readily available, or when a transferor desires to verify that information received by one of those methods is correct or up-to-date, the transferor may obtain and record confirmation, from the department, the United States nuclear regulatory commission or an agreement state, that the transferee is licensed to receive the radioactive material.


28-35-191a. Modification, revocation, and termination of licenses. (a) Any license may be suspended or revoked by reason of amendment to the act or these regulations or by an order of the secretary.

(b) Any license may be revoked, suspended, or modified, in whole or in part:

(1) For any material false statement in the application or any statement of fact required under provision of the act or these regulations;
(2) because of any condition, revealed by the application, or any statement of fact, or any report, record, or inspection or other means, which would warrant the denial of an original application; or

(3) for violation of, or failure to observe, any of the terms and conditions of the license, or any requirement of the act, or any rule and regulation or order of the secretary.

(c) Except in cases in which the public health, interest, or safety requires otherwise, no license shall be modified, suspended, or revoked unless, prior to the institution of such proceedings:

(1) those facts or conduct which appear to warrant such action have been called to the attention of the licensee in writing; and

(2) the licensee has been accorded an opportunity to demonstrate or achieve compliance with all lawful requirements.

(d) The secretary may revoke a specific license upon written request of a licensee. (Authorized by and implementing K.S.A. 1984 Supp. 48-1607; effective, T-86-37, Dec. 11, 1985; effective May 1, 1986.)


28-35-192a. Exemptions; source material. (a) Each person who only acquires, possesses, uses, or transfers source material in any chemical mixture, compound, solution, or alloy in which the source material, by weight, is less than 0.05 percent of the mixture, compound, solution, or alloy shall be exempt from these regulations.

(b) Each person who only acquires, possesses, uses, or transfers unrefined and unprocessed ore containing source material and does not refine or process the ore shall be exempt from these regulations.

(c) Each person who only acquires, possesses, uses, or transfers any of the following shall be exempt from the requirements for a license in part 3 of these regulations and the requirements of parts 4 and 10 of these regulations:

(1) Any quantities of thorium contained in any of the following:

(A) Incandescent gas mantles;
(B) vacuum tubes;
(C) welding rods;
(D) electric lamps for illuminating purposes, if each lamp does not contain more than 50 milligrams of thorium;
(E) germicidal lamps, sunlamps, and lamps for outdoor or industrial lighting, if each lamp does not contain more than two grams of thorium;
(F) rare earth metals and compounds, mixtures, and products containing not more than 0.25 percent thorium or uranium, or both, by weight; or
(G) personnel neutron dosimeters, if each dosimeter does not contain more than 50 milligrams of thorium;

(2) source material contained in any of the following:
(A) glazed ceramic tableware, if the glaze contains not more than 20 percent source material, by weight;
(B) glassware containing not more than two percent of source material by weight or, for glassware manufactured before August 27, 2013, 10 percent of source material by weight. This exemption shall not include commercially manufactured glass brick, pane glass, ceramic tile or other glass, or ceramic used in construction;
(C) glass enamel or glass enamel frit that contains not more than 10 percent of source material, by weight, and that was imported or ordered for importation into the United States, or initially distributed by manufacturers in the United States, before July 25, 1983; or
(D) piezoelectric ceramic containing not more than two percent of source material by weight;
(3) photographic film, negatives, and prints containing uranium or thorium;
(4) any finished product or part of a product fabricated of, or containing, tungsten or magnesium-thorium alloys if the thorium content of the alloy does not exceed four percent, by weight. The exemption contained in this paragraph shall not be deemed to authorize the chemical, physical, or metallurgical treatment or processing of any product or part of a product;
(5) uranium used as shielding and constituting part of any shipping container. The uranium shielding shall be conspicuously and legibly impressed with the words "CAUTION—
RADIOACTIVE SHIELDING—URANIUM" and shall be enclosed in steel containing no more than 0.25 percent carbon, or another equally fire-resistant metal, with a minimum wall thickness of one-eighth inch (3.2 mm);

(6) thorium or uranium contained in finished optical lenses, if each lens does not contain more than 30 percent of thorium or uranium by weight or, if manufactured after August 27, 2013, 10 percent of thorium or uranium by weight. The exemption in this paragraph shall not be deemed to authorize either of the following:

(A) The shaping, grinding, or polishing of the lens or any manufacturing processes other than the assembly of the lens into optical systems and devices without any alteration of the lens; or

(B) the receipt, possession, use, or transfer of thorium or uranium contained in contact lenses, or in eyeglasses, or in eyepieces in binoculars or other optical instruments;

(7) uranium contained in detector heads for use in fire detection units, if each detector head contains not more than 0.005 microcurie of uranium; or

(8) thorium contained in any finished aircraft engine part containing nickel-thoria alloy, if both of the following conditions are met:

(A) The thorium is dispersed in the nickel-thoria alloy in the form of finely divided thoria (thorium dioxide); and

(B) the thorium content in the nickel-thoria alloy does not exceed four percent by weight.

(d)(1) Each person who acquires, possesses, uses, or transfers uranium contained in counterweights installed in aircraft, rockets, projectiles or missiles or stored or handled in connection with installation or removal of these counterweights, except counterweights manufactured before December 31, 1969 under a specific license issued by the atomic energy commission and impressed with the legend required by that license, shall be exempt from the requirements for a license in part 3 of these regulations and the requirements of parts 4 and 10 of these regulations if both of the following conditions are met:

(A) Each counterweight has been impressed in a manner that is clearly legible through any plating or covering with the following words: "DEPLETED URANIUM."
(B) Each counterweight is durably and legibly labeled or marked with the identification of the manufacturer and the following words: "UNAUTHORIZED ALTERATIONS PROHIBITED."

(2) The exemption specified in this subsection shall not be deemed to authorize the chemical, physical, or metallurgical treatment or processing of any counterweights, other than repair or restoration of any plating or other covering.

(e)(1) No person shall initially transfer for sale or distribution a product containing source material to any persons exempt under subsections (c) and (d) or equivalent regulations of an agreement state, unless authorized by a license issued by the nuclear regulatory commission (NRC) to initially transfer the products for sale or distribution.

(2) Each person authorized by an agreement state to manufacture, process, or produce materials or products containing source material and each person who imports finished products or parts for sale or distribution shall be authorized by a license issued by the NRC for distribution only. (Authorized by and implementing K.S.A. 48-1607; effective, T-86-37, Dec. 11, 1985; effective May 1, 1986; amended May 4, 2018.)

28-35-192b. Exemptions; exempt concentrations of radioactive materials. (a) Except as provided in K.A.R. 28-35-184a(e) [p.141], a person shall be exempt from these regulations to the extent that the person acquires, possesses, uses, transfers, or owns products or materials containing radioactive material in concentrations not exceeding those specified in K.A.R. 28-35-198a [p.163].

(b) A person shall be exempt from these regulations to the extent that the person acquires, possesses, uses, or transfers products containing naturally occurring radionuclides of elements with an atomic number less than 82, in isotopic concentrations not in excess of those that occur naturally.

(c) This regulation shall not be deemed to authorize the import of radioactive material or products containing radioactive material.

(d) A person who manufactures, processes, or produces a product or material shall be exempt from the requirements for a license as set forth in these regulations to the extent that the transfer
radiation control program

28-35-192c of the radioactive material contained in the product or material is in concentrations not in excess of the amounts specified in K.A.R. 28-35-198a [p.163] and is introduced into the product or material by a licensee holding a specific license issued by the department expressly authorizing such introduction. This exemption shall not apply to the transfer of radioactive material contained in any food, beverage, cosmetic, drug, or other commodity or product designed for ingestion or inhalation by, or application to, a human being.

(e) No person shall introduce radioactive material into a product or material knowing, or having reason to believe, that the product or material will be transferred to a person exempt from these regulations under subsection (a) or under an equivalent regulation of the nuclear regulatory commission or an agreement state, except in accordance with a specific license issued under K.A.R. 28-35-181e [p.110] or the general license issued in K.A.R. 28-35-194a [p.159]. (Authorized by and implementing K.S.A. 48-1607; effective, T-86-37, Dec. 11, 1985; effective May 1, 1986; amended March 18, 2011.)

28-35-192c. Exceptions; other radioactive material.

Except for persons who apply tritium, promethium-147, or radium to, or persons who incorporate tritium, promethium-147, or radium into, the products listed in this regulation, each person who only acquires, possesses, uses, or transfers any of the following products shall be exempt from these regulations:

(a) Timepieces or hands or dials containing radium, or timepieces, hands, or dials containing not more than the following specified quantities of other radioactive materials:
   (1) 25 millicuries of tritium per timepiece;
   (2) 5 millicuries of tritium per hand;
   (3) 15 millicuries of tritium per dial. Bezels, when used, shall be considered as part of the dial;
   (4) 100 microcuries of promethium-147 per watch or 200 microcuries of promethium-147 per any other timepiece;
   (5) 20 microcuries of promethium-147 per watch hand or 40 microcuries of promethium-147 per hand on other timepieces;
   (6) 60 microcuries of promethium-147 per watch dial or 120 microcuries of promethium-147 per dial on other timepieces. Bezels, when used, shall be considered as part of the dial. The levels of radiation from hands and dials containing promethium-147 shall
not exceed the following, when measured through 50 milligrams per square centimeter of absorber:

(A) For wrist watches, 0.1 millirad per hour at 10 centimeters from any surface;
(B) for pocket watches, 0.1 millirad per hour at one centimeter from any surface; and
(C) for any other timepiece, 0.2 millirad per hour at 10 centimeters from any surface; and

(7) for intact timepieces manufactured before November 30, 2007, 0.037 megabecquerel (1 microcurie) of radium-226 per timepiece;

(b) balances of precision containing not more than one millicurie of tritium per balance or not more than 0.5 millicurie of tritium per balance part manufactured before December 17, 2007;
(c) marine compasses containing not more than 750 millicuries of tritium gas and other marine navigational instruments containing not more than 250 millicuries of tritium gas manufactured before December 17, 2007;
(d) ionization chamber smoke detectors containing not more than one microcurie (uCi) of americium-241 per detector in the form of a foil and designed to protect life and property from fires;
(e) electron tubes. The levels of radiation from each electron tube containing radioactive material shall not exceed one millirad per hour at one centimeter from any surface when measured through seven milligrams per square centimeter of absorber. For purposes of this subsection, "electron tubes" shall include spark gap tubes, power tubes, gas tubes including glow lamps, receiving tubes, microwave tubes, indicator tubes, pickup tubes, radiation detection tubes, and any other completely sealed tube that is designed to conduct or control electrical currents. An electron tube shall not contain more than one of the following specified quantities of radioactive material:

(1) 150 millicuries of tritium per microwave receiver protector tube or 10 millicuries of tritium per any other electron tube;

(2) 1 microcurie cobalt-60;
(3) 5 microcuries nickel-63;
(4) 30 microcuries krypton-85;
(5) 5 microcuries cesium-137; or
(6) 30 microcuries promethium-147; and

(f) ionizing radiation-measuring instruments containing, for purposes of internal calibration or standardization, sources of radioactive material. No source shall exceed the applicable quantity specified in K.A.R. 28-35-197b [p.163]. No single instrument shall contain more than 10 sources. For the purposes of this subsection, \(0.05\) Ci of Am-241 shall be considered an exempt quantity. (Authorized by and implementing K.S.A. 48-1607; effective, T-86-37, Dec. 11, 1985; effective May 1, 1986; amended March 18, 2011; amended May 4, 2018.)


28-35-192e. Exemptions; gas and aerosol detectors containing radioactive material. (a) Except for persons who manufacture, process, or produce gas and aerosol detectors containing radioactive material or who initially transfer these products for sale or distribution, each person who acquires, receives, owns, possesses, uses, or transfers radioactive material in gas and aerosol detectors designed to protect life or property from fires and airborne hazards shall be exempt from these regulations. Each detector shall have been manufactured, processed, produced, imported, or initially transferred in accordance with a specific license issued by the secretary pursuant to K.A.R. 28-35-181q [p.131] or a license issued by the nuclear regulatory commission or by an agreement state pursuant to an equivalent regulation of the nuclear regulatory commission or the agreement state.

(b) Gas and aerosol detectors previously manufactured and distributed before November 30, 2007 to general licensees in accordance with a specific license issued by an agreement state shall be exempt under subsection (a) if the device is labeled in accordance with the specific license authorizing distribution of the general licensed device and if the detectors meet the requirements of K.A.R. 28-35-181r [p.132].

(c) Each person who desires to manufacture, process, or produce gas and aerosol detectors containing radioactive material, or to initially transfer these products for use pursuant to this regulation, shall apply for a license pursuant to K.A.R. 28-35-181q
28-35-192f. Exemptions; self-luminous products containing tritium, krypton-85 or promethium-147. (a) Except for persons who manufacture, process, or produce self-luminous products containing tritium, krypton-85, or promethium-147 and except as provided in subsection, (b) any person shall be exempt from these regulations to the extent that person acquires, possesses, uses, or transfers, tritium, krypton-85, or promethium-147 in self-luminous products manufactured, processed, produced, imported, or transferred in accordance with a specific license issued by the United States nuclear regulatory commission pursuant to Section 32.22 of Title 10 CFR 31, which authorizes the transfer of the product to persons who are exempt from regulatory requirements.

(b) The exemption in subsection (a) shall not apply to tritium, krypton-85, or promethium-147 used in toys, adornments, or similar items. (Authorized by and implementing K.S.A. 1984 Supp. 48-1607; effective, T-86-37, Dec. 11, 1985; effective May 1, 1986.)

28-35-192g. Exemptions; exempt quantities. (a) Except as provided in subsections (c) through (e), each person who acquires, possesses, uses, owns, receives, or transfers radioactive material in individual quantities that do not exceed the applicable quantity specified in K.A.R. 28-35-197b [p.163] shall be exempt from these regulations.

(b) Each person who possesses radioactive material received or acquired before January 1, 1972 under the general license then provided in K.A.R. 28-35-178a [p.79] shall be exempt from these regulations to the extent that the person possesses, uses, owns, or transfers that radioactive material. This exemption shall not apply to radium-226.

(c) This regulation shall not authorize the production, packaging, repackaging, or transfer of radioactive material for purposes of commercial distribution, or the incorporation of radioactive material into products intended for commercial distribution.
(d) No person shall, for purposes of commercial distribution, transfer radioactive material in the individual quantities specified in K.A.R. 28-35-197b [p.163] knowing, or having reason to believe, that those quantities of radioactive material will be transferred to a person exempt under this regulation or an equivalent regulation of the nuclear regulatory commission (NRC) or an agreement state, except in accordance with a specific license issued by the secretary under K.A.R. 28-35-181r [p.132], an equivalent regulation of the NRC, or an equivalent regulation of an agreement state.

(e) No person shall, for purposes of producing an increased radiation level, combine quantities of radioactive material covered by this exemption so that the aggregate quantity exceeds the individual quantities specified in K.A.R. 28-35-197b [p.163].


28-35-192h. Certain industrial devices. (a) Except as specified in subsections (b) and (c), each person who receives, possesses, uses, transfers, owns, or acquires any industrial device containing by-product material designed and manufactured for either of the following purposes shall be exempt from these regulations:

1. Detecting, measuring, gauging, or controlling thickness, density, level, interface location, radiation, leakage, or qualitative or quantitative chemical composition; or
2. Producing an ionized atmosphere if the industrial device is manufactured, processed, produced, or initially transferred in accordance with a specific license issued by the nuclear regulatory commission (NRC).

(b) Each person who manufactures, processes, produces, or initially transfers for sale or distribution any industrial device containing by-product material designed and manufactured for either of the following purposes shall be excluded from the exemption in subsection (a):

1. Detecting, measuring, gauging, or controlling thickness, density, level, interface location, radiation, leakage, or qualitative or quantitative chemical composition; or
2. Producing an ionized atmosphere.
(c) The exemption in subsection (a) shall exclude any source not incorporated into an industrial device, including calibration and reference sources.

(d) Each person who manufactures, processes, produces, or initially transfers for sale or distribution any industrial device containing by-product material for use under subsection (a) shall apply for a license and a certificate of registration from the NRC.

(Authorized by and implementing K.S.A. 48-1607; effective May 4, 2018.)


28-35-193a. Pre-licensing inspections. The department may request verification of information provided in any application or request additional information that is necessary to make a determination as to whether a license should be granted or denied and whether any special conditions should be attached to the license. This information may be obtained by visiting the facility or location where radioactive materials would be possessed or used, and by discussing details of proposed possession or use of the radioactive material with the applicant or the applicant's designated representatives. (Authorized by and implementing K.S.A. 1984 Supp. 48-1607; effective, T-86-37, Dec. 11, 1985; effective May 1, 1986.)


28-35-194a. Reciprocal recognition of licenses. (a) Subject to other provisions in this regulation, any person may apply for a general license to conduct activities within this state without obtaining a specific license from the secretary, if all of the following conditions are met:
(1) The person possesses a specific license issued by the nuclear regulatory commission or an agreement state, other than this state, that authorizes the proposed activities.

(2) The person does not conduct any activities authorized by any general license issued under this regulation for a period totalling more than 180 days in a calendar year.

(3) The specific license does not limit the activity authorized to a specified installation or location.

(4) The person notifies the department in writing at least five days before engaging in the activity. The notification shall indicate the location, period, and type of proposed possession and use within the state and shall be accompanied by a copy of the specific license. If, for a specific case, the five-day period would impose an undue hardship, the person may, upon application to the department, obtain permission by letter, facsimile, or electronic communication to proceed.

(5) The person complies with all applicable regulations of the secretary and with all the terms and conditions of the specific license, except any term or condition of the license that is inconsistent with these regulations.

(6) The person supplies any information requested by the department.

(7) The person does not transfer or dispose of radioactive material possessed or used under the general license provided in this regulation except by transfer to a person who meets either of the following conditions:

(A) Is specifically licensed by the department or the nuclear regulatory commission to receive the material; or

(B) is exempt from the requirements for a license for that material under K.A.R. 28-35-192a, 28-35-192b, 28-35-192c, 28-35-192d, 28-35-192e, 28-35-192f, or 28-35-192g [p.150-157].

(b) Any person who holds a specific license issued by the nuclear regulatory commission, or an agreement state that authorizes the person to manufacture, transfer, install, or service a device described in K.A.R. 28-35-178b [p.80] within areas subject to the jurisdiction of the licensing body is issued a general license to manufacture, install, transfer, or service those devices in this state subject to the following requirements:

(1) The person shall satisfy the requirements of K.A.R. 28-35-184a(e)(1) and (2) [p.141].
(2) The device shall be manufactured, labeled, installed, and serviced in accordance with the provisions of the specific license issued to the person by the nuclear regulatory commission or the agreement state.

(3) The person shall ensure that any labels required to be affixed to the device, under regulations of the authority that licensed the manufacture of the device, and that bear the statement "Removal of this label is prohibited" are affixed to the device.

(4) The person shall furnish to each general licensee to whom the person transfers the device, or on whose premises the person installs the device, a copy of the general license issued in K.A.R. 28-35-178b [p.80].

(c) Acceptance of any specific license recognized under this regulation or any product distributed pursuant to such a license may be withdrawn, limited, or qualified by the secretary, upon determining that the action is necessary in order to protect health or minimize danger to life or property. (Authorized by and implementing K.S.A. 48-1607; effective, T-86-37, Dec. 11, 1985; effective May 1, 1986; amended March 18, 2011.)


28-35-195a. Intrastate transportation of radioactive materials. (a) Each common or contract carrier shall be deemed to have been issued a general license to transport and store radioactive material in the regular course of its carriage for another, if the transportation and storage are performed in accordance with the regulations of the U.S. department of transportation. Each person who transports and stores radioactive material pursuant to the general license specified in this subsection shall be exempt from the requirements of parts 4 and 10 of these regulations.

(b) Each private carrier shall be deemed to have been issued a general license to transport radioactive material, if the transportation is performed in accordance with the regulations of the U.S. department of transportation. Each person who transports radioactive material under the general license issued in this
subsection shall be exempt from the requirements of parts 4 and 10 of these regulations.

(c) Each physician shall be exempt from the requirements of subsection (b) of this regulation to the extent that the physician transports radioactive material for use in the practice of medicine. (Authorized by and implementing K.S.A. 48-1607; effective, T-86-37, Dec. 11, 1985; effective May 1, 1986; amended Dec. 30, 2005.)


28-35-196a. Preparation of radioactive material for transport. (a) A licensee shall not deliver any radioactive material to a carrier for transport, or transport radioactive material as a private carrier, unless:

(1) The licensee complies with the applicable requirements of the regulations of the U.S. department of transportation that are appropriate to the mode of transport and that are related to the packing of radioactive material, and to the monitoring, marking, and labeling of those packages;

(2) the licensee has established procedures for opening and closing packages in which radioactive material is transported to provide safety and to assure that, prior to the delivery to a carrier for transport, each package is properly closed for transport; and

(3) prior to delivery of a package to a carrier for transport, the licensee has assured that any special instructions needed to safely open the package are sent to, or are available to, the consignee.

(b) The requirements in subsection (a) of this regulation shall not apply to the transportation of licensed material, or to the delivery of licensed material to a carrier for transport, when the transportation is subject to regulations of the U.S. postal service. (Authorized by and implementing K.S.A. 1984 Supp. 48-1607; effective, T-86-37, Dec. 11, 1985; effective May 1, 1986.)

28-35-196b. Transportation of radioactive material. (a) No person shall deliver radioactive material to a carrier for transport or transport radioactive material except as authorized in a general or specific license issued by the department unless:
(1) That person's activities are exempted from licensure by Section 28-35-140(b) of these regulations;

(2) each of the packages delivered to a carrier for transport or transported contains radioactive materials bearing a specific activity of less than, or equal to, 0.002 microcurie (74 Bq) per gram; or

(3) the packages delivered to a carrier for transport are subject to the regulations of the U.S. Postal Service. (Authorized by and implementing K.S.A. 1984 Supp. 48-1607; effective, T-86-37, Dec. 11, 1985; effective May 1, 1986.)


28-35-197b. Schedule B; exempt quantities of radioactive material. The provisions of 10 C.F.R. 30.71, as in effect on November 30, 2007, are hereby adopted by reference, except that the word "byproduct" shall be replaced with "radioactive." (Authorized by and implementing K.S.A. 48-1607; effective May 4, 2018.)


28-35-198a. Schedule C; Exempt concentrations.

<table>
<thead>
<tr>
<th>Element (atomic number)</th>
<th>Isotope</th>
<th>Column I Gas Concentration uCi/ml</th>
<th>Column II Liquid and solid concentration uCi/ml</th>
</tr>
</thead>
<tbody>
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<tr>
<td></td>
<td>Sb 124</td>
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<tr>
<td></td>
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<td></td>
<td></td>
<td>1 X 10^{-3}</td>
<td></td>
</tr>
<tr>
<td>Element (atomic number)</td>
<td>Isotope</td>
<td>Column I Gas Concentration uCi/ml</td>
<td>Column II Liquid and solid concentration uCi/ml</td>
</tr>
<tr>
<td>------------------------</td>
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<tr>
<td>Argon (18)</td>
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<tr>
<td></td>
<td>As 74</td>
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<td></td>
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<td>As 77</td>
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<td>Element (atomic number)</td>
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<td>Column II Liquid and solid concentration uCi/ml&lt;sup&gt;2&lt;/sup&gt;</td>
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<td>In 114m</td>
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<td>1 X 10&lt;sup&gt;-6&lt;/sup&gt;</td>
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NOTE 1: Many radioisotopes disintegrate into isotopes which are also radioactive. In expressing the concentrations in 28-35-198a, Schedule C, the activity state is that of the parent isotope and takes into account the daughters.

NOTE 2: For purposes of 28-35-192b, when a combination of isotopes is involved, the limit for the combination shall be derived as follows: Determine for each isotope in the product the ratio between the concentration present in the product and the exempt concentration established in 28-35-198a, Schedule C, for the specific isotope when not in combination. The sum of those ratios may not exceed "1" (i.e., unity).

<sup>1</sup> Values are given only for those materials normally used as gases.

<sup>2</sup> uCi/gm for solids. (Authorized by and implementing K.S.A. 1984 Supp. 48-1607; effective, T-86-37, Dec. 11, 1985; effective May 1, 1986.)


28-35-200a. Schedule E; Possession limits authorized under types b & c specific licenses of broad scope.

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(Authorized by and implementing K.S.A. 1984 Supp. 48-1607; effective, T-86-37, Dec. 11, 1985; effective May 1, 1986.)

**28-35-201. Schedule F. (a) Single isotope quantities.**

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(b) Combinations of isotopes. For the purposes of K.A.R. 28-35-180b [p.98], when a combination of isotopes in known amounts is involved, the limit for the combination shall be derived by determining, for each isotope in the combination, the ratio between the quantity present in the combination and the limit otherwise established for the specific isotope when not in combination. The sum of the ratios for all the isotopes in the combination shall not exceed one, which is also referred to as "unity." (Authorized by and implementing K.S.A. 48-1607; effective Nov. 1, 1996; amended July 27, 2007.)


28-35-203. Schedule G; Criteria relating to use of financial tests and parent company guarantees for providing reasonable assurance of funds for decommissioning. (a) Each applicant or licensee providing assurance of the availability of funds for decommissioning based on a parent company guarantee that funds will be available for decommissioning costs based on a demonstration that the parent company passes a financial test shall meet the following standards:
(b) Each licensee or applicant applying to the department for
recognition of a parent company guarantee for the purposes of
complying with the requirements of K.A.R. 28-35-180b [p.98] shall
be required to show that the parent company guarantee meets the
following criteria:

(1) Each parent company shall meet two of the following
three ratios:

(A) A ratio of total liabilities to net worth that is less than
2.0;

(B) a ratio of the sum of net income plus depreciation,
depletion, and amortization to total liabilities that is greater than 0.1; or

(C) a ratio of current assets to current liabilities that is greater
than 1.5.

(2) Each parent company shall have net working capital and
tangible net worth each of which is equal a minimum of six times
the current decommissioning cost estimates, or the prescribed
amount if a certification is used based on the requirements of K.A.R.
28-35-180b [p.98].

(3) Each parent company shall have assets located in the
United States amounting to at least 90 percent of the company's total
assets or at least six times the current decommissioning cost
estimates, or at least six times the prescribed amount if a
certification is used based on the requirements of K.A.R. 28-35-
180b [p.98].

(4) Each parent company shall have the following:

(A) A current rating for the company's most recent bond
issuance of AAA, AA, A, or BBB as issued by standard and poor's
or Aaa, Aa, A, or Baa as issued by moody's;

(B) a tangible net worth at least six times the current
decommissioning cost estimate, or the prescribed amount if a
certification is used based on the requirements of K.A.R. 28-35-
180b [p.98];

(C) a tangible net worth of at least $10 million; and

(D) assets located in the United States amounting to at least
90 percent of the company's total assets or at least six times the
current decommissioning cost estimates, or at least six times the
prescribed amount if certification is used based on the requirements
(c) The parent company's independent certified public accountant shall compare the data used by the parent company in the financial test, which shall be derived from the independently audited, year-end financial statements for the latest fiscal year, with the amounts in the financial statement. If any matters come to the auditor's attention that cause the auditor to believe that the data specified in the financial test should be adjusted and that the company no longer passes the test, the licensee shall notify the department within 90 days of the date the auditor identifies the matter.

(d) After the initial financial test, the parent company shall be required to pass the test within 90 days after the close of each succeeding fiscal year.

(1) If the parent company no longer meets the requirements of subsection (a), the licensee shall notify the department of the licensee's intent to establish alternate financial assurance as specified in these regulations.

(2) The notice shall be sent by certified mail within 90 days after the end of the fiscal year for which the year-end financial data shows that the parent company no longer meets the financial test requirements.

(3) The licensee shall provide alternate financial assurance within 120 days after the end of a fiscal year for which the year-end financial data shows that the parent company no longer meets the financial test requirements.

(e) Each parent company guarantee obtained by an applicant or licensee shall contain terms that provide the following information:

(1) The parent company guarantee shall remain in force unless the guarantor sends notice of cancellation by certified mail to the licensee and the department. The guarantee shall not be canceled during the 120 days beginning on the date of receipt of the notice of cancellation by both the licensee and the department, as evidenced by the return receipts.

(2) If the licensee fails to provide alternate financial assurance within 90 days after receipt of a notice of cancellation of the parent company guarantee by the licensee and the department, the guarantor shall provide the alternative financial assurance in the name of the licensee.
(3) The parent company guarantee and financial test provisions shall remain in effect until the secretary has terminated the license.

(4) If a trust is established for decommissioning costs, the trustee and trust shall be acceptable to the secretary. An acceptable trustee may be an appropriate state or federal government agency or an entity that has the authority to act as a trustee and whose trust operations are regulated and examined by a federal or state agency. (Authorized by and implementing K.S.A. 48-1607; effective Nov. 1, 1996; amended July 27, 2007.)

28-35-204. Decommissioning plan. (a) Each licensee shall submit a decommissioning plan if at least one of the following conditions is met:


(2) A decommissioning plan is otherwise required by these regulations.

(3) A decommissioning plan is required by a license condition.

(4) The procedures and activities necessary to carry out decommissioning of the site or separate building or outdoor area have not been previously approved by the department, and these procedures could increase the potential health and safety impact on workers or on the public, including any of the following types of procedures:

(A) Procedures that would involve techniques not applied routinely during cleanup or maintenance operations;

(B) procedures permitting workers to enter areas not normally occupied where surface contamination and radiation levels are higher than routinely encountered during the operation for which the license was issued;

(C) procedures that could result in greater airborne concentrations of radioactive materials than are present during operation;

(D) procedures that could result in greater releases of radioactive material to the environment than those associated with the operation for which the license was issued; or
(E) procedures with a potential health and safety impact that could be carried out before approval of the decommissioning plan.

(b) The proposed decommissioning plan for the facility or site, or separate building or outdoor area, shall include the following:

(1) A description of the conditions of the facility or site sufficient to evaluate the acceptability of the plan;

(2) a description of the planned decommissioning operations;

(3) a description of the methods used to ensure the protection of workers and the environment against radiation hazards during decommissioning;

(4) a description of the radiation survey planned to demonstrate compliance with subsection (e) or with K.A.R. 28-35-205 [p.185]; and

(5) an updated, detailed cost estimate of decommissioning, comparison of that estimate with the present funds set aside for decommissioning, and a plan for ensuring the availability of adequate funds for completion of the decommissioning.

(c) For decommissioning plans calling for completion of decommissioning more than 24 months after plan approval, the plan shall include a justification for the delay. The proposed decommissioning plan shall not be approved unless the licensee demonstrates that the decommissioning will be completed as soon as practicable and that the health and safety of the workers and the public will be protected.

(d) Each licensee shall complete the decommissioning of the facility or site as soon as practicable but not more than 24 months following the initiation of decommissioning, unless an alternate schedule addressing the factors specified in subsection (f) is approved.

(e) If decommissioning involves the entire site, the licensee shall request license termination upon completion of the decommissioning operations.

(f) For decommissioning plans calling for the completion of decommissioning more than 24 months after plan approval, the plan shall include a written justification for the decommissioning schedule warranted by consideration of the following:

(1) Whether it is technically feasible to complete decommissioning within the allotted 24-month period;
(2) whether waste disposal capacity is available to allow the completion of decommissioning within the allotted 24-month period;

(3) whether a volume reduction of wastes requiring disposal will be achieved by allowing short-lived radionuclides to decay;

(4) whether a reduction in radiation exposure to workers can be achieved by allowing short-lived radionuclides to decay; and

(5) whether other site-specific factors exist. These factors may include the regulatory requirements of other government agencies, lawsuits, groundwater treatment operations, monitored natural groundwater restoration, and actions that could result in more environmental harm than deferred cleanup.

(g) Each licensee shall perform the following final steps in decommissioning:

(1) Conduct a radiation survey of the premises where the licensed operations were carried out and submit a report of the results of this survey, unless the licensee demonstrates that the premises are suitable for release in some other manner. Each licensee shall complete the following, as appropriate:

(A) Report the levels of gamma radiation in units of millisieverts or microrems per hour at one meter from surfaces and report the levels of radioactivity, including alpha and beta, in units of megabecquerels, disintegrations per minute, or microcuries per milliliter for water, and becquerels or picocuries per gram for solids, including soil and concrete; and

(B) specify the survey instrument or instruments used and certify that each instrument is calibrated and tested.

(2) Each licensee shall certify the disposition of all licensed material, including accumulated wastes, by submitting a completed form specified by the department or the equivalent information to the department. (Authorized by and implementing K.S.A. 48-1607; effective Dec. 30, 2005.)

28-35-205. Termination of a license without restriction.

(a) A site shall be considered acceptable for unrestricted use if both of the following conditions are met:

(1) The residual radioactivity that is distinguishable from background radiation results in a TEDE to an average member of the critical group that does not exceed 0.25 millisievert or 25 mrem
per year, including the residual radioactivity from groundwater sources of drinking water.

(2) The residual radioactivity has been reduced to levels that are as low as reasonably achievable (ALARA). Any detriment, including any deaths from transportation accidents that could result from decontamination and waste disposal, shall be taken into consideration by the secretary.

(b) Each specific license, including any expired license, shall be terminated upon written notice to the licensee if the secretary determines that all of the following conditions are met:

(1) All radioactive material has been properly disposed of.
(2) A reasonable effort has been made to eliminate the residual radioactive contamination, if present.
(3) Documentation has been provided to the department demonstrating one of the following:
   (A) A radiation survey has been performed and shows that the premises meet the requirements of this regulation.
   (B) The other information submitted by the licensee is sufficient to show that the premises are suitable for release in accordance with this regulation. (Authorized by and implementing K.S.A. 48-1607; effective Dec. 30, 2005.)

28-35-205a. License termination under restricted conditions. A site may be considered by the secretary to be acceptable for license termination under restricted conditions if all of the following conditions are met:

(a)(1) The licensee demonstrates that further reductions in residual radioactivity necessary to comply with the provisions of K.A.R. 28-35-205(a) [p.186] would result in public or environmental harm or were not being made because the residual levels associated with restricted conditions are ALARA. The demonstration shall reflect the licensee's consideration of any detriment that could result from decontamination and waste disposal; and

(2) the licensee has made provisions for legally enforceable institutional controls that provide reasonable assurance that the TEDE from residual radioactivity distinguishable from background to the average member of the critical group will not exceed 0.25 millisievert or 25 mrem per year, including that from groundwater sources of drinking water.
(b) The licensee has provided sufficient financial assurance to enable an independent third party, including a governmental custodian of a site, to assume and carry out responsibilities for any necessary control and maintenance of the site. Each of the following financial assurance mechanisms shall be acceptable:

(1) Funds placed into an account segregated from the licensee's assets and outside the licensee's administrative control as specified in K.A.R. 28-35-180b [p.98];

(2) a surety method, insurance policy, or other guarantee method as described in K.A.R. 28-35-180b [p.98];

(3) a statement of intent in the case of federal, state, or local government licensees, as described in K.A.R. 28-35-180b [p.98]; or

(4) when a governmental entity is assuming custody and ownership of a site, an arrangement that is deemed acceptable by the governmental entity.

c) The licensee has submitted a decommissioning plan to the department indicating the licensee's intent to decommission in accordance with K.A.R. 28-35-204 [p.183] and specifying that the licensee intends to decommission by restricting the use of the site. The licensee shall document in the decommissioning plan how the advice of individuals and institutions in the community who could be affected by the decommissioning has been sought and incorporated, as appropriate, following analysis of that advice.

(1) Each licensee proposing to decommission by restricting the use of the site shall seek advice from the affected parties regarding the following matters concerning the proposed decommissioning:

(A) Whether the provisions for institutional controls proposed by the licensee will provide reasonable assurance of the following:

(i) That the TEDE from residual radioactivity distinguishable from background to the average member of the critical population will not exceed the applicable limit specified in part 4 of these regulations;

(ii) that the controls are enforceable; and

(iii) that the controls do not impose undue burdens on the local community or other affected parties; and

(B) whether or not the licensee has provided sufficient financial assurance to enable an independent third party, including
a governmental custodian of a site, to assume and carry out the responsibilities for any necessary control and maintenance of the site.

(2) In seeking advice on the issues identified in this subsection, the licensee shall provide for the following:

(A) Participation by representatives of a broad cross section of community interests who could be affected by the decommissioning;

(B) an opportunity for a comprehensive, collective discussion of the issues by the participants represented; and

(C) a publicly available summary of the results of all discussions specified in paragraph (c)(2)(B), including a description of the individual viewpoints of the participants on the issues and the extent of agreement and disagreement among the participants on the issues.

(d) Residual radioactivity at the site has been reduced so that if the institutional controls were no longer in effect, there is reasonable assurance that the TEDE from residual radioactivity distinguishable from background to the average member of the critical group is as low as reasonably achievable and would not exceed either of the following:

(1) 1 millisievert (100 mrem) per year; or

(2) 5 millisieverts (500 mrem) per year if the licensee demonstrates the following:

(A) Further reductions in residual radioactivity necessary to comply with the limit specified in paragraph (d)(1) are not technically achievable, would be prohibitively expensive, or would result in additional public or environmental harm;

(B) provisions for ongoing, enforceable institutional controls exist; and

(C) sufficient financial assurance exists to enable a responsible government entity or independent third party, including a governmental custodian of a site, to carry out periodic rechecks of the site at least every five years to ensure that the institutional controls remain in place as necessary to meet the requirements in this regulation and to assume and carry out the responsibilities for any necessary controls and maintenance of those controls. The financial assurance mechanisms shall be those specified in subsection (b).
(e)(1) If the department receives a decommissioning plan from the licensee or a proposal by the licensee for the release of a site pursuant to this regulation or K.A.R. 28-35-205b [p.189], the following shall be notified by the department and solicited for comments:

(A) The local and state governments in the vicinity of the site and any Indian nation or other indigenous people that have treaty or statutory rights that could be affected by the decommissioning; and

(B) the EPA, if the licensee proposes to release a site pursuant to K.A.R. 28-35-205b [p.189].

(2) Subsequent notifications and solicitations for comments of the entities specified in paragraphs (e)(1)(A) and (B) may be made by the department if the secretary deems these actions to be in the public interest.

(3) The notifications specified in this subsection shall be published in the Kansas register and in a forum, which may consist of a local newspaper, letter to a state or local organization, or other appropriate forum, that is readily accessible to individuals in the vicinity of the site, and solicit comments from affected parties.

(Authorized by and implementing K.S.A. 48-1607; effective Dec. 30, 2005.)

28-35-205b. Alternate criteria for license termination. A license shall be terminated by the secretary using alternate criteria greater than the dose criteria specified in K.A.R. 28-35-205a [p.186] only if the licensee provides all of the following information:

(a) Evidence that public health and safety and the environment would continue to be protected and that it is unlikely that the dose from all man-made sources combined, other than medical, could be more than the limit of one millisievert per year or 100 mrem per year specified in part 4 of these regulations, by submitting an analysis of the possible sources of exposure;

(b) restrictions, to the extent practical, on site use according to the provisions of K.A.R. 28-35-205a [p.186] to minimize exposure at the site;

(c) evidence that doses have been reduced to ALARA levels, taking into consideration any detriment, including any traffic
accidents that could result from decontamination and waste disposal;

(d) a decommissioning plan indicating the licensee's intent to decommission in accordance with this part and specifying that the licensee proposes to decommission by the use of alternate criteria. The licensee shall document in the decommissioning plan how the advice of individuals and institutions in the community who might be affected by the decommissioning has been sought and addressed, as appropriate, following analysis of that advice. In seeking this advice, the licensee shall provide for the following:

(1) Participation by representatives of a broad cross section of community interests who could be affected by the decommissioning;

(2) an opportunity for comprehensive, collective discussions of the issues by the participants represented; and

(3) a publicly available summary of the results of all the discussions specified in paragraph (d)(2), including a description of the individual viewpoints of the participants on the issues and the extent of agreement and disagreement on the issues among the participants; and

(e) sufficient financial assurance, as specified in K.A.R. 28-35-180b [p.98], to enable an independent third party, including a governmental custodian of a site, to assume and carry out the responsibilities for any necessary control and maintenance of the site. (Authorized by and implementing K.S.A. 48-1607; effective Dec. 30, 2005; amended May 4, 2018.)

28-35-206. Applicability of decommissioning requirements following license termination. If, after a site has been decommissioned and associated license has been terminated, new information shows that the requirements specified in these regulations were not met or that the residual radioactivity at the site could result in a significant threat to public health and safety and the environment, then the former licensee shall be required to perform any additional decontamination that is deemed necessary by the secretary. (Authorized by and implementing K.S.A. 48-1607; effective Dec. 30, 2005.)

28-35-211a. Persons to whom the standards apply. (a) Except as specifically provided in other parts of these regulations, these regulations shall apply to persons licensed or registered by the department to receive, possess, use, transfer, or dispose of sources of radiation. The limits in these regulations shall not apply to:
   (1) doses due to background radiation;
   (2) exposure of patients to radiation for the purpose of medical diagnosis or therapy; or
   (3) voluntary participation in medical research programs.
   (b) Nothing in these regulations shall be construed as limiting actions that may be necessary to protect health and safety.


28-35-211d. Radiation protection programs. (a) Each licensee or registrant shall develop, document, and implement a radiation protection program sufficient to ensure compliance with the provisions of these regulations.
   (b) Each licensee or registrant shall use, to the extent practicable, procedures and engineering controls based upon sound radiation protection principles to achieve occupational doses and public doses that are as low as is reasonably achievable (ALARA).
   (c) To implement the ALARA requirements of this regulation and the requirements in K.A.R. 28-35-214a [p.206], each licensee or registrant shall establish a constraint on the air emissions of radioactive material to the environment, excluding radon-222 and its daughters, so that the individual member of the public likely to
receive the highest dose is not expected to receive a total effective dose equivalent in excess of 10 mrem (0.1 mSv) per year from these emissions. If a licensee or registrant subject to this requirement exceeds this dose constraint, the licensee or registrant shall report the exceedance as specified in K.A.R. 28-35-230a [p.241] and shall take appropriate corrective action to ensure against recurrence.

(d) Each licensee or registrant shall, at intervals not to exceed 12 months, review the radiation protection program content and implementation. (Authorized by and implementing K.S.A. 48-1607; effective Oct. 17, 1994; amended Dec. 30, 2005.)


28-35-212a. Occupational dose limits for adults. (a) Each licensee or registrant shall control the occupational dose to individual adults, except for planned special exposures to the following dose limits:

(1) The annual limit shall be the more limiting of either of the following:

(A) The total effective dose equivalent being equal to 0.05 Sv (5 rem); or

(B) the sum of the deep dose equivalent and the committed dose equivalent to any individual organ or tissue other than the lens of the eye being equal to 0.50 Sv (50 rem).

(2) The annual limits to the lens of the eye, to the skin, and to the extremities shall be the following:

(A) An eye dose equivalent of 0.15 Sv (15 rem); and

(B) a shallow dose equivalent of 0.50 Sv (50 rem) to the skin or to any extremity.

(b) Doses received in excess of the annual limits, including doses received during accidents, emergencies, and planned special exposures, shall be subtracted from the limits for planned special exposures that the individual could receive during the current year and during the individual's lifetime.

(c) When the external exposure is determined by measurement with an external personal monitoring device, the deep dose equivalent shall be used in place of the effective dose equivalent, unless the effective dose equivalent is determined by a
dosimetry method approved by the secretary. The assigned deep
dose equivalent shall be for the portion of the body receiving the
highest exposure. The assigned shallow dose equivalent shall be the
dose averaged over the contiguous 10 square centimeters of skin
receiving the highest exposure.

(1) The deep dose equivalent, eye dose equivalent, and
shallow dose equivalent may be assessed from surveys or other
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.

(2) If a protective apron is worn by medical fluoroscopists
performing special and interventional fluoroscopic procedures and
monitoring is conducted as specified in K.A.R. 28-35-217a [p.210],
the use of weighting factors in determining the effective dose
equivalent for external radiation may be approved by the secretary
upon receipt of a written request. In no case shall the use of
weighting factors be approved unless the request is accompanied by
a list of the procedures to be used to ensure that exposures are
maintained ALARA and the effective dose equivalent is determined
as follows:

(A) If only one individual monitoring device is used and the
device is located at the neck outside the protective apron, the
reported deep dose equivalent shall be the effective dose equivalent
for external radiation.

(B) If only one individual monitoring device is used, the
device is located at the neck outside the protective apron, and the
reported dose exceeds 25 percent of the limit specified in this
regulation, then the reported deep dose equivalent value multiplied
by 0.3 shall be the effective dose equivalent for external radiation.

(C) If individual monitoring devices are worn, both under
the protective apron at the waist and outside the protective apron at
the neck, the effective dose equivalent for external radiation shall be
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 neck
outside the protective apron multiplied by 0.04.
(3) All individuals who are associated with the operation of an X-ray system shall be subject to the occupational exposure limits and the requirements for the determination of the doses that are specified in this regulation. In addition, each individual shall meet the following requirements:

(A) When protective clothing or devices are worn on portions of the body and one or more monitoring devices are required, at least one monitoring device shall be utilized as follows:

(i) When an apron is worn, the monitoring device shall be worn at the collar outside of the apron;

(ii) the dose to the device, if one is used, shall be recorded as the whole-body dose based on the maximum dose attributed to any one critical organ, including the gonads, the blood-forming organs, the head and trunk, and the lens of the eye. If more than one device is used and a record is made of the data, each dose shall be identified with the area where the device was worn on the body;

(4) Exposure of a personnel-monitoring device to deceptively indicate a dose delivered to an individual shall be prohibited.

(5) If the individual is exposed during procedures not specifically approved, weighting factors shall not be applied.

(d) Derived air concentration (DAC) and annual limit on intake (ALI) values, in appendix B, table I, published in "appendices to part 4: standards for protection against radiation," which is adopted in K.A.R. 28-35-135a [p.3], shall be used to determine the individual's dose and to demonstrate compliance with the occupational dose limits.

(e) Notwithstanding the annual dose limits, the licensee shall limit the soluble uranium intake by an individual to 10 milligrams in a week in consideration of chemical toxicity, in accordance with footnote 3 of appendix B published in "appendices to part 4: standards for protection against radiation," which is adopted in K.A.R. 28-35-135a [p.3].

(f) Each licensee or registrant shall reduce the dose that an individual may be allowed to receive in the current year by the amount of occupational dose received while employed by any other person. (Authorized by and implementing K.S.A. 48-1607; effective, T-85-43, Dec. 19, 1984; effective May 1, 1985; amended Sept. 20, 1993; amended Oct. 17, 1994; amended Dec. 30, 2005; amended March 18, 2011.)
28-35-212b. Compliance with requirements for summation of external and internal doses. (a) If the licensee or registrant is required to monitor pursuant to both K.A.R. 28-35-217a [p.210] (a) and (d), the licensee or registrant shall demonstrate compliance with the dose limits by summing external and internal doses.

(1) If the licensee or registrant is required to monitor pursuant to only K.A.R. 28-35-217a(a) [p.210] or K.A.R. 28-35-217a(d) [p.211], then the summation shall not be required to demonstrate compliance with the dose limits.

(2) The dose equivalents for the lens of the eye, the skin, and the extremities shall not be included in the summation and shall be subject to separate limits.

(b) Any licensee or registrant may demonstrate compliance with the requirements for summation of external and internal doses pursuant to the following:

(1) Intake by inhalation. If the only intake of radionuclides is by inhalation, the total effective dose equivalent limit shall not be deemed to be exceeded if the sum of the deep dose equivalent divided by the total effective dose equivalent limit, and one of the following, does not exceed one:

(A) The sum of the fractions of the inhalation ALI for each radionuclide;

(B) The total number of derived air concentration-hours (DAC-hours) for all radionuclides divided by 2,000; or

(C) the sum of the calculated committed effective dose equivalents to all significantly irradiated organs or tissues (T) calculated from bioassay data using appropriate biological models and expressed as a fraction of the annual limit. For purposes of this requirement, an organ or tissue shall be deemed to be significantly irradiated if, for that organ or tissue, the product of the weighting factors, wT, and the committed dose equivalent, HT, is greater than 10 percent of the maximum weighted value of H50.

(2) Intake by oral ingestion. If the occupationally exposed individual receives an intake of radionuclides by oral ingestion greater than 10 percent of the applicable oral ALI, the licensee or registrant shall account for this intake and include it in demonstrating compliance with the limits.
(3) Intake through wounds or absorption through skin. The licensee or registrant shall evaluate and, to the extent practical, account for intakes through wounds or skin absorption. The intake through intact skin is included in the calculation of DAC for hydrogen-3 and shall not be required to be evaluated or accounted for pursuant to this subsection. (Authorized by and implementing K.S.A. 48-1607; amended Sept. 20, 1993; amended Oct. 17, 1994; amended Dec. 30, 2005.)

28-35-212c. Determination of external dose from airborne radioactive material. (a) When determining the dose from airborne radioactive material, the licensee or registrant shall include the contribution to the deep dose equivalent, eye dose equivalent, and shallow dose equivalent from external exposure to the radioactive cloud.

(b) Airborne radioactivity measurements and DAC values shall not be used as the primary means to assess the deep dose equivalent when the airborne radioactive material includes radionuclides other than noble gases or if the cloud of airborne radioactive material is not relatively uniform. The determination of the deep dose equivalent to an individual shall be based upon measurements using instruments or individual monitoring devices. (Authorized by and implementing K.S.A. 1993 Supp. 48-1607; effective Oct. 17, 1994.)

28-35-212d. Determination of internal exposure. (a) When assessing the dose used to determine compliance with occupational dose equivalent limits, each licensee or registrant shall, when required pursuant to K.A.R. 28-35-217b [p.211], take suitable and timely measurements of any of the following:

(1) Concentrations of radioactive materials in the air in work areas;
(2) quantities of radionuclides in the body;
(3) quantities of radionuclides excreted from the body; or
(4) any combination of the measurements specified in paragraphs (a)(1) through (3).

(b) Unless respiratory protective equipment is used, as specified in K.A.R. 28-35-212g [p.202], or the assessment of intake is based on bioassays, the licensee or registrant shall assume that an
individual inhales radioactive material at the airborne concentration in which the individual is present.

(c) If specific information on the physical and biochemical properties of the radionuclides taken into the body or the behavior of the material in an individual is known, the licensee or registrant may perform the following:

(1) Use that information to calculate the committed effective dose equivalent, and if used, the licensee or registrant shall document that information in the individual's record;

(2) before approval of the secretary, adjust the DAC or ALI values to reflect the actual physical and chemical characteristics of airborne radioactive material; and

(3) separately assess the contribution of fractional intakes of class D, W, or Y compounds of a given radionuclide to the committed effective dose equivalent.

(d) If the licensee or registrant chooses to assess intakes of class Y material using the measurements given in paragraph (a)(2) or (3), the licensee or registrant may delay the recording and reporting of the assessments for up to seven months, unless otherwise required by K.A.R. 28-35-229a [p.240] or K.A.R. 28-35-230a [p.241], in order to make additional measurements basic to the assessments.

(e) If the identity and concentration of each radionuclide in a mixture are known, the fraction of the DAC applicable to the mixture for use in calculating DAC-hours shall be either of the following:

(1) The sum of the ratios of the concentration to the appropriate DAC value, from appendix B published in "appendices to part 4: standards for protection against radiation," as adopted in K.A.R. 28-35-135a [p.3], for each radionuclide in the mixture; or

(2) the ratio of the total concentration for all radionuclides in the mixture to the most restrictive DAC value for any radionuclide in the mixture.

(f) If the identity of each radionuclide in a mixture is known but the concentration of one or more of the radionuclides in the mixture is not known, the DAC for the mixture shall be the most restrictive DAC of any radionuclide in the mixture.
(g) If a mixture of radionuclides in air exists, a licensee or registrant may disregard certain radionuclides in the mixture if all of the following conditions are met:

1. The licensee or registrant uses the total activity of the mixture in demonstrating compliance with the dose limits in K.A.R. 28-35-212b [p.195] and in complying with the monitoring requirements in K.A.R. 28-35-217a (d) [p.210].

2. The concentration of any radionuclide disregarded is less than 10 percent of its DAC.

3. The total concentration of all of the radionuclides disregarded in the mixture does not exceed 30 percent.

(h) When determining the committed effective dose equivalent, the following information may be considered.

1. In order to calculate the committed effective dose equivalent, the licensee or registrant may assume that the inhalation of one ALI, or an exposure of 2,000 DAC-hours, results in a committed effective dose equivalent of 0.05 Sv (5 rem) for radionuclides that have their ALIs or DACs based on the committed effective dose equivalent.

2. For an ALI and the associated DAC determined by the nonstochastic organ dose limit of 0.50 Sv (50 rem), the intake of radionuclides that would result in a committed effective dose equivalent of 0.05 Sv (5 rem), which is the stochastic ALI, is listed in parentheses in appendix B, table I in "appendices to part 4: standards for protection against radiation," as adopted in K.A.R. 28-35-135a [p.3]. The licensee or registrant may, as a simplifying assumption, use the stochastic ALI to determine the committed effective dose equivalent. However, if the licensee or registrant uses the stochastic ALI, the licensee or registrant shall also demonstrate that the limit in K.A.R. 28-35-212a(a)(1) (B) [p.192] is met. (Authorized by and implementing K.S.A. 48-1607; effective Oct. 17, 1994; amended Dec. 30, 2005.)

**28-35-212e. Determination of prior occupational dose.** (a)
For each individual who could enter the licensee's or registrant's restricted or controlled area and is likely to receive, in a year, an occupational dose requiring monitoring pursuant to K.A.R. 28-35-217a [p.210], the licensee or registrant shall perform the following:

1. Determine the occupational radiation dose received during the current year; and
(2) attempt to obtain the records of lifetime cumulative occupational radiation dose.

(b) Before permitting an individual to participate in a planned special exposure, the licensee or registrant shall determine all of the following:

(1) The internal and external doses from all previous planned special exposures;

(2) all doses in excess of the limits, including the doses received during accidents and emergencies, by the individual; and

(3) all of the lifetime cumulative occupational radiation dose.

(c) In complying with the requirements of this regulation, a licensee or registrant may perform the following:

(1) 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 most recent employer for work involving radiation exposure, that discloses the nature and the amount of any occupational dose that the individual received during the current year;

(2) accept, as the record of the lifetime cumulative radiation dose, an up-to-date record on a form prescribed by the department or an equivalent form, signed by the individual and countersigned by an appropriate official of the most recent employer for work involving radiation exposure, or the individual's current employer, if the individual is not employed by the licensee or registrant; and

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

(d)(1) The licensee or registrant shall record the exposure history on a form prescribed by the department, or on a clear and legible record that includes all the information required on that form. The form or record shall show each period in which the individual received occupational exposure to radiation or radioactive material and shall be signed by the individual who received the exposure. For each period for which the licensee obtains reports, the licensee or
registrar shall use the dose shown in the report in preparing the history. For any period in which the licensee or registrant does not obtain a report, the licensee or registrant shall place a notation in the history indicating the periods of time for which data are not available.

(2) A licensee or registrant shall not be required to reevaluate the separate external dose equivalents and internal committed dose equivalents or intakes of radionuclides assessed before January 1, 1994. Although occupational exposure histories obtained and recorded before January 1, 1994 did not include effective dose equivalent, the histories may be used in the absence of specific information on the intake of radionuclides by the individual.

(e) If the licensee or registrant is unable to obtain a complete record of an individual's current and previously accumulated occupational dose, the licensee or registrant shall assume the following:

(1) That, in establishing administrative controls under K.A.R. 28-35-212a(f) [p.194] for the current year, the allowable dose limit for the individual has been reduced by 12.5 mSv (1.25 rem) for each quarter for which records were unavailable and the individual was engaged in activities that could have resulted in occupational radiation exposure; and

(2) that the individual is not available for planned special exposures.

(f) Each licensee or registrant shall retain the records of exposure history until the secretary terminates each pertinent license or registration requiring this record. Each licensee or registrant shall retain the information used in preparing records of exposure history for three years after the record is made. (Authorized by and implementing K.S.A. 48-1607; effective Oct. 17, 1994; amended Dec. 30, 2005.)

28-35-212f. Planned special exposures. (a) A licensee or registrant may authorize an adult worker to receive doses in addition to and accounted for separately from the doses received under the limits specified in K.A.R. 28-35-212a [p.192].

(b) The authorization of doses under K.A.R. 28-35-212f(a) [p.200], called planned special exposure, shall only be permitted if each of the following conditions is satisfied.
(1) The licensee or registrant shall authorize a planned special exposure only in an exceptional situation when alternatives that might avoid the higher exposure are unavailable or impractical.

(2) The licensee or registrant, and employer if the employer is not the licensee or registrant, shall specifically authorize the planned special exposure, in writing, before the exposure occurs.

(3) Before a planned special exposure, the licensee or registrant shall ensure that each individual involved is:
   (A) informed of the purpose of the planned operation;
   (B) informed of the estimated doses and associated potential risks and specific radiation levels or other conditions that might be involved in performing the task; and
   (C) instructed in the measures to be taken to keep the dose ALARA considering other risks that may be present.

(4) Prior to permitting an individual to participate in a planned special exposure, the licensee or registrant shall ascertain prior doses as required by K.A.R. 28-35-212e [p.198] during the lifetime of the individual for each individual involved.

(5) Subject to K.A.R. 28-35-212a(b) [p.192], the licensee or registrant shall not authorize a planned special exposure that would cause an individual to receive a dose from all planned special exposures and all doses in excess of the limits to exceed:
   (A) the numerical values of any of the dose limits in K.A.R. 28-35-212a [p.192] in any year; or
   (B) five times the annual dose limits in K.A.R. 28-35-212a [p.192] during the individual's lifetime.

(6) The licensee or registrant shall maintain records of the conduct of a planned special exposure in accordance with K.A.R. 28-35-227g [p.236] and shall submit a written report in accordance with K.A.R. 28-35-230c [p.243].

(7) The licensee or registrant shall record the best estimate of the dose resulting from the planned special exposure in the individual's record and shall inform the individual, in writing, of the dose within 30 days from the date of the planned special exposure. The dose from planned special exposures shall not be considered in controlling future occupational dose of the individual pursuant to K.A.R. 28-35-212a [p.192] but shall be included in evaluations required by K.A.R. 28-35-212f(b)(4) and (5) [p.201]. (Authorized
28-35-212g. **Respiratory protection and controls to restrict internal exposure in restricted areas.** (a) Use of process or other engineering controls. The licensee or registrant shall use, to the extent practicable, process or other engineering controls, such as containment or ventilation, to control the concentrations of radioactive material in air.

(b) Use of other controls. When it is not practicable to apply process or other engineering controls to control the concentrations of radioactive material in air to values below those that define an airborne radioactivity area, the licensee or registrant shall, consistent with maintaining the total effective dose equivalent ALARA, increase monitoring and limit intakes by one or more of the following means:

1. control of access;
2. limitation of exposure times;
3. use of respiratory protection equipment; or
4. other controls.

(c) Use of individual respiratory protection equipment. (1) If the licensee or registrant uses respiratory protection equipment to limit intakes pursuant to K.A.R. 28-35-212g(b) [p.202], the following conditions shall apply.

   (A) Except as provided in K.A.R. 28-35-212g(c)(1)(B) [p.202], the licensee or registrant shall use only respiratory protection equipment that is tested and certified or had certification extended by the national institute for occupational safety and health and the mine safety and health administration (NIOSH/MSHA).

   (B) If the licensee or registrant wishes to use equipment that has not been tested or certified by the NIOSH/MSHA or has not had certification extended by the NIOSH/MSHA, or for which there is no schedule for testing extended by the NIOSH/MSHA, or for which there is no schedule for testing or certification, the licensee or registrant shall submit an application for authorized use of that equipment, including a demonstration by testing, or a demonstration on the basis of reliable test information, that the material and performance characteristics of the equipment are capable of providing the proposed degree of protection under anticipated conditions of use.
(C) The licensee or registrant shall implement and maintain a respiratory protection program that includes:

(i) air sampling sufficient to identify the potential hazard, permit proper equipment selection, and estimate exposures;

(ii) surveys and bioassays, as appropriate, to evaluate actual intakes;

(iii) testing of respirators for operability immediately prior to each use;

(iv) written procedures regarding selection, fitting, issuance, maintenance, and testing of respirators, including testing for operability immediately prior to each use; supervision and training of personnel; monitoring, including air sampling and bioassays; and recordkeeping; and

(v) determination by a physician prior to initial fitting of respirators, and at least every 12 months thereafter, that the individual user is physically able to use the respiratory protection equipment.

(D) The licensee or registrant shall issue a written policy statement on respirator usage covering:

(i) the use of process or other engineering controls, instead of respirators;

(ii) routine, nonroutine, and emergency use of respirators; and

(iii) length of periods of respirator use and relief from respirator use.

(E) The licensee or registrant shall advise each respirator user that the user may leave the area at any time for relief from respirator use in the event of equipment malfunction, physical or psychological distress, procedural or communication failure, significant deterioration of operating conditions, or any other conditions that might require such relief; and

(F) the licensee or registrant shall use respiratory protection equipment within the equipment manufacturer's expressed limitations for type and mode of use and shall provide proper visual, communication, and other special capabilities, such as adequate skin protection, when needed.

(2) When estimating exposure of individuals to airborne radioactive materials, the licensee or registrant may make allowance for respiratory protection equipment used to limit intakes pursuant
to K.A.R. 28-35-212g(b) [p.202], provided that the following conditions, in addition to those in K.A.R. 28-35-212g(c)(1) [p. 202], are satisfied.

(A) (i) The licensee or registrant shall select respiratory protection equipment that provides a protection factor, specified in appendix A protection factor for registrant published in "Kansas Department of Health and Environment Appendices to Part 4: Standards for Protection Against Radiation," effective April, 1994, greater than the multiple by which peak concentrations of airborne radioactive materials in the working area are expected to exceed the values specified in appendix B, table I, column 3 published in "Kansas Department of Health and Environment Appendixes to Part 4 Standards for Protection Against Radiation," effective April, 1994. However, if the selection of respiratory protection equipment with a protection factor greater than the peak concentration is inconsistent with the goal specified in K.A.R. 28-35-212g(b) [p. 202] of keeping the total effective dose equivalent ALARA, the licensee or registrant may select respiratory protection equipment with a lower protection factor provided that such a selection would result in a total effective dose equivalent that is ALARA.

(ii) The concentration of radioactive material in the air that is inhaled when respirators are worn may be initially estimated by dividing the average concentration in air, during each period of uninterrupted use, by the protection factor. If the exposure is later found to be greater than initially estimated, the corrected value shall be used; if the exposure is later found to be less than initially estimated, the corrected value may be used.

(B) The licensee or registrant shall obtain authorization from the department before assigning respiratory protection factors in excess of those specified in K.A.R. 28-35-232a [p.249] appendix A. The department may authorize a licensee or registrant to use higher protection factors on receipt of an application that:

(i) describes the situation for which a need exists for higher protection factors; and

(ii) demonstrates that the respiratory protection equipment provides these higher protection factors under the proposed conditions of use.

(3) In an emergency, the licensee or registrant shall use as emergency equipment only respiratory protection equipment that
has been specifically certified or had certification extended for emergency use by the NIOSH/MSHA.

(4) The licensee or registrant shall notify the department in writing at least 30 days before the date that respiratory protection equipment is first used pursuant to either K.A.R. 28-35-212g(1) or (2) [p. 192]. (Authorized by and implementing K.S.A. 1993 Supp. 48-1607; effective Oct. 17, 1994.)


28-35-213b. Dose to an embryo or fetus. (a) Each licensee or registrant shall ensure that the dose to an embryo or fetus during the entire pregnancy, due to occupational exposure of a declared pregnant woman, does not exceed 5 mSv (0.5 rem).

(b) Each licensee or registrant shall make efforts to avoid substantial variation above a uniform monthly exposure rate to a declared pregnant woman in order to satisfy the limit in subsection (a).

(c) The dose to an embryo or fetus shall be the sum of the following:

(1) The dose to the embryo or fetus from radionuclides in the embryo or fetus and radionuclides in the declared pregnant woman; and

(2) either of the following doses that is more representative of the dose to the embryo or fetus from external radiation:

(A) If multiple measurements have not been made, assignment of the highest deep dose equivalent for the declared pregnant woman shall be the dose to the embryo or fetus as specified in K.A.R. 28-35-212e [p. 198]; or
(B) if multiple measurements have been made, assignment of the deep dose equivalent for the declared pregnant woman from the individual monitoring device that is most representative of the dose to the embryo or fetus shall be the dose of the embryo or fetus. Assignment of the highest deep dose equivalent for the declared pregnant woman to the embryo or fetus shall not be required unless that dose is also the most representative deep dose equivalent for the region of the embryo or fetus.

(d) If by the time the woman declares pregnancy to the licensee or registrant, the dose to the embryo or fetus has exceeded 4.5 mSv (0.45 rem), the licensee or registrant shall be deemed to be in compliance with subsection (a) if the additional dose to the embryo or fetus does not exceed 0.50 mSv (0.05 rem) during the remainder of the pregnancy. (Authorized by and implementing K.S.A. 48-1607; effective Oct. 17, 1994; amended Dec. 30, 2005.)


28-35-214a. Dose limits for individual members of the public. (a) Each licensee or registrant shall conduct operations so that:

(1) the total effective dose equivalent to individual members of the public from the licensed or registered operation does not exceed 1 mSv (0.1 rem) in a year, exclusive of the dose contribution from the licensee's or registrant's disposal of radioactive material into sanitary sewerage in accordance with K.A.R. 28-35-224a [p.232]; and

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

(b) If the licensee or registrant permits members of the public to have access to controlled areas, the limits for members of the public shall continue to apply to those individuals.

(c) A licensee, registrant, or an applicant for a license or registration may apply for prior department authorization to operate up to an annual dose limit for an individual member of the public of 5 mSv (0.5 rem). This application shall include the following information:
(1) demonstration of the need for and the expected duration of operations in excess of the limit in K.A.R. 28-35-214a(a)(1) or (2) [p.206];
(2) the licensee's or registrant's program to assess and control dose within the 5 mSv (0.5 rem) annual limit; and
(3) the procedures to be followed to maintain the dose ALARA. (Authorized by and implementing K.S.A. 1993 Supp. 48-1607; effective, T-85-43, Dec. 19, 1984; effective May 1, 1985; amended Sept. 20, 1993, amended Oct. 17, 1994.)

28-35-214b. Compliance with dose limits for individual members of the public. (a) The licensee or registrant shall make or cause to be made surveys of radiation levels in unrestricted and controlled areas and radioactive materials in effluents released to unrestricted and controlled areas to demonstrate compliance with the dose limits for individual members of the public in K.A.R. 28-35-214a [p.206].
(b) A licensee or registrant shall show compliance with the annual dose limit in K.A.R. 28-35-214a [p.206] by:
(1) demonstrating by measurement or calculation that the total effective dose equivalent to the individual likely to receive the highest dose from the licensed or registered operation does not exceed the annual dose limit; or
(2) demonstrating that:
   (A) the annual average concentrations of radioactive material released in gaseous and liquid effluents at the boundary of the unrestricted area do not exceed the values specified in appendix B, table II published in "Kansas Department of Health and Environment Appendices to Part 4: Standards for Protection Against Radiation," effective April, 1994; and
   (B) if an individual were continually present in an unrestricted area, the dose from external sources would not exceed 0.02 mSv (0.002 rem) in an hour and 0.50 mSv (0.05 rem) in a year.
(c) Upon approval from the department, the licensee or registrant may adjust the effluent concentration values in appendix B, table II published in "Kansas Department of Health and Environment Appendices to Part 4: Standards for Protection Against Radiation," effective April, 1994, for members of the public, to take into account the actual physical and chemical characteristics of the
effluents, including aerosol size distribution, solubility, density, radioactive decay equilibrium, and chemical form. (Authorized by and implementing K.S.A. 1993 Supp. 48-1607; effective Oct. 17, 1994.)


28-35-216a. Testing for leakage or contamination of sealed sources. (a) Each licensee in possession of any sealed source shall ensure that all of the following requirements are met:

(1) Each sealed source, except as specified in subsection (b), shall be tested for leakage or contamination, and the test results shall be received before the sealed source is put into use, unless the licensee has a certificate from the transferor indicating that the sealed source was tested within six months before transfer to the licensee.

(2) Each sealed source that is not designed to emit alpha particles shall be tested for leakage or contamination at intervals not to exceed six months or at alternative intervals approved by the secretary, an agreement state, a licensing state, or the nuclear regulatory commission.

(3) Each sealed source designed to emit alpha particles shall be tested for leakage or contamination at intervals not to exceed three months or at alternative intervals approved by the secretary, an agreement state, a licensing state, or the nuclear regulatory commission.

(4) For each sealed source required to be tested for leakage or contamination, whenever there is reason to suspect that the sealed source might have been damaged or might be leaking, the licensee shall ensure that the sealed source is tested for leakage or contamination before further use.
(5) Tests for leakage for all sealed sources shall be capable of detecting the presence at 185 Bq (0.005 uCi) of radioactive material on a test sample. Test samples shall be taken from the sealed source or from the surfaces of the container in which the sealed source is stored or mounted and on which one might expect contamination to accumulate. For a sealed source contained in a device, test samples shall be obtained when the source is in the "off" position.

(b) The following sealed sources shall be exempt from testing for leakage and contamination:

1. Sealed sources containing only radioactive material with a half-life of fewer than 30 days;
2. sealed sources containing only radioactive material as a gas;
3. sealed sources containing 3.7 Mbq (100 uCi) or less of beta-emitting or photon-emitting material or 370 kBq (10 uCi) or less of alpha-emitting material;
4. sealed sources containing only hydrogen-3;
5. seeds of iridium-192 encased in nylon ribbon; and
6. sealed sources, except sources used in radiation therapy, that are stored, are not being used, and are identified as being in storage. The sources exempted from this test shall be tested for leakage before any use or transfer to another person, unless the source has been leak-tested within six months before the date of the use or transfer. The sources in storage shall be physically inventoried every six months and listed in the radioactive materials inventory. Each source in storage shall be tested for leakage at least every 10 years.

(c) Each test for leakage or contamination from sealed sources shall be performed by a person specifically authorized by the secretary, an agreement state, a licensing state, or the nuclear regulatory commission to perform these services.

(d) All test results shall be recorded in units of becquerel or microcurie and maintained for inspection by the department.

(e) If any test reveals the presence of 0.005 microcurie or more of removable contamination, the licensee shall immediately withdraw the sealed source from use and shall cause the source to be decontaminated and repaired or to be disposed of in accordance with these regulations. The licensee shall file a report within five
days of the test with the radiation control program, Kansas
department of health and environment, describing the equipment
involved, the test results, and the corrective action taken.
(Authorized by and implementing K.S.A. 48-1607; effective, T-85-
43, Dec. 19, 1984; effective May 1, 1985; amended Dec. 30, 2005;
amended July 27, 2007; amended March 18, 2011.)

28-35-217. (Authorized by K.S.A. 48-1607; effective Jan. 1,

28-35-217a. Conditions requiring individual monitoring
of external and internal occupational dose.

(a) Each licensee or registrant shall monitor exposures from
sources of radiation at levels sufficient to demonstrate compliance
with the occupational dose limits of these regulations. At a
minimum, each licensee or registrant shall monitor occupational
exposure to radiation and shall supply and require the use of
individual monitoring devices by the following:

(1) Any adult likely to receive, in one year from sources
external to the body, a dose in excess of 10 percent of the limits
specified in K.A.R. 28-35-212a [p.192];

(2) any minor or declared pregnant woman likely to receive,
in one year from sources external to the body, a dose in excess of 10
percent of any of the applicable limits specified in K.A.R. 28-35-
213a or K.A.R. 28-35-213b [p.205]; and

(3) any individual entering a high or very high radiation area.

(b) Except as specified in this regulation, each personnel-
monitoring device that requires processing to determine the
radiation dose and is utilized by the licensee or registrant to comply
with this regulation, with other applicable parts of these regulations,
or with conditions specified in a license or a registration shall be
processed and evaluated by a dosimetry processor accredited by the
"national voluntary laboratory accreditation program" of the
national institute of standards and technology, and approved in this
accreditation process for each type of radiation that most closely
approximates each type of radiation for which the individual
wearing the dosimeter is monitored.

(c) The requirements of subsection (b) in this regulation shall
not apply to personnel-monitoring devices used to measure the dose
to hands and forearms or to feet and ankles.
28-35-217b. General monitoring requirements. (a) Each licensee or registrant shall make, or cause to be made, surveys of each area of use, including the subsurface, that meet the following requirements:

1. Provide measurements or evaluations demonstrating compliance with these regulations; and
2. Are necessary under the circumstances to evaluate the following:
   A. Radiation and radiological contamination levels;
   B. Concentrations or quantities of radioactive material; and
   C. The potential radiological hazards that could be present.

(b) Records from surveys describing the location and amount of subsurface residual radioactivity identified at the facility out to the site boundary shall be kept on file with records required for decommissioning.

(c) Each licensee or registrant shall ensure that instruments and equipment used for quantitative radiation measurements are calibrated at intervals not to exceed 12 months, for the type of radiation measured.

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

(e) All personnel dosimeters, except for direct and indirect reading pocket ionization chambers and those dosimeters used to measure the dose to the extremities that require processing to
determine the radiation dose and are used by licensees to comply with these regulations or with conditions specified in a license, shall be processed and evaluated by a dosimetry processor that meets the following requirements:

(1) Holds current personnel dosimetry accreditation from the national voluntary laboratory accreditation program (NVLAP) of the national institute of standards and technology; and

(2) is accredited 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. (Authorized by and implementing K.S.A. 48-1607; effective Oct. 17, 1994; amended May 4, 2018.)


28-35-218a. Bioassays. Where necessary or desirable in order to aid in determining the extent of an individual's exposure to concentrations of radioactive material, a licensee may be required by the department, through license provisions or an order, to make available to the individual appropriate bioassay services and to furnish a copy of the reports of those services to the department. (Authorized by and implementing K.S.A. 1992 Supp. 48-1607; effective, T-85-43, Dec. 19, 1984; effective May 1, 1985; amended Sept. 20, 1993.)


(a) General.

(1) Except as otherwise authorized by the department, the symbol prescribed by this regulation shall use the conventional radiation caution colors, which are magenta, purple, or black on a yellow background. The symbol shall be the conventional three-blade design with the phrases and graphic as follows:
(2) In addition to the contents of signs and labels prescribed in this regulation, any licensee or registrant may provide on or near signs and labels any additional information that is appropriate in aiding individuals to minimize exposure to radiation.

(b) Radiation areas. Each radiation area shall be conspicuously posted with a sign or signs bearing the radiation caution symbol and the following words:

CAUTION (or DANGER)
RADIATION AREA

(c) High radiation areas.

(1) Each high radiation area shall be conspicuously posted with a sign or signs bearing the radiation caution symbol and the following words:
(2) Each registrant or licensee shall ensure that the entrance or access point to a high radiation area meets one or more of the following conditions:

(A) Is equipped with a control device that, upon entry into the area, causes the level of radiation to be reduced below that at which an individual might receive a deep dose equivalent of 100 millirems (1.0 mSv) in one hour at 30 centimeters from any surface that the radiation penetrates; or

(B) is equipped with a control device that energizes a conspicuous visible or audible alarm signal in such a manner that the individual entering the high radiation area and the licensee or a supervisor of the activity is made aware of the entry; or

(C) is required to be locked except during periods when access to the area is required, with positive control over each individual entry.

(3) The controls required by paragraphs (c)(2) and (d)(2) shall be established so that no individual will be prevented from leaving a high radiation area or a very high radiation area.

(4) If a high radiation area is established for a period of 30 days or less, direct surveillance to prevent unauthorized entry may be substituted for the controls required by paragraph (c)(2) of this regulation.

(5) Any licensee or registrant may apply to the department for approval of methods not included in paragraphs (c)(2), (4), and (6) of this regulation. The proposed alternatives shall be approved by the secretary if the licensee or registrant demonstrates that the alternative methods of control will prevent unauthorized entry into a high radiation area, and that the requirement of paragraph (c)(3) of this regulation is met.

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

(7) The licensee or registrant shall not be required to control each entrance or access point to a room or other area that is a high radiation area solely because of the presence of radioactive materials prepared for transport and packaged and labeled in accordance with
the regulations of the U.S. department of transportation if the following conditions are met:

(A) The packages do not remain in the area longer than three days.

(B) The dose rate at one meter from the external surface of any package does not exceed 0.1 mSv (0.01 rem) per hour.

(8) The licensee or registrant shall not be required to control entrance or access to rooms or other areas in hospitals solely because of the presence of patients containing radioactive material if there are personnel in attendance who are taking the necessary precautions to prevent the exposure of individuals to radiation or radioactive material in excess of the established limits in these regulations and to operate within the ALARA provisions of the licensee's or registrant's radiation protection program.

(9) The registrant shall not be required to control entrance or access to rooms or other areas containing sources of radiation capable of producing a high radiation area as described in this regulation if the registrant has met all the specific requirements for access and control specified in other applicable regulations, part 7 for industrial radiography, part 5 for X-rays in the healing arts, and part 9 for particle accelerators.

(d) Very high radiation areas.

(1) Each very high radiation area shall be conspicuously posted with a sign or signs bearing the radiation caution symbol and the following words:

**GRAVE DANGER**

**VERY HIGH RADIATION AREA**

(2) Each registrant or licensee shall institute measures to ensure that an individual is not able to gain unauthorized or inadvertent access to an area in which radiation levels could be encountered at five Gy (500 rad) or more in one hour at one meter from a source of radiation or any surface through which the radiation penetrates. This area is called a very high radiation area.

(A) Paragraph (d)(2) shall not apply to rooms or areas in which diagnostic X-ray systems are the only source of radiation, or to non-self-shielded irradiators.

(B) The registrant or licensee shall not be required to control entrance or access to rooms or other areas containing sources of
radiation capable of producing a very high radiation area, as described in this regulation, if the registrant or licensee has met all the specific requirements for access and control specified in part 7 for industrial radiography, part 5 for X-rays in the healing arts, and part 9 for particle accelerators.

(3) Control of access to very high radiation areas; irradiators.

(A) Paragraph (d)(3) shall apply to licensees or registrants with sources of radiation in non-self-shielded irradiators and shall not apply to sources of radiation used in teletherapy, in industrial radiography, or in completely self-shielded irradiators in which the source of radiation is both stored and operated within the same shielding radiation barrier and, in the designed configuration of the irradiator, is always physically inaccessible to any individual and cannot create a high level of radiation in an area that is accessible to any individual.

(B) Each area in which there could exist radiation levels in excess of five Gy (500 rad) in one hour at one meter from a source of radiation that is used to irradiate materials shall be equipped with entry control devices that perform the following:

(i) function automatically to prevent any individual from inadvertently entering a very high radiation area;

(ii) permit deliberate entry into the area only after a control device is actuated that causes the radiation level within the area, from the source of radiation, to be reduced below that at which it would be possible for an individual to receive a deep dose equivalent in excess of 1 mSv (0.1 rem) in one hour; and

(iii) prevent operation of the source of radiation if the source would produce radiation levels in the area that could result in a deep dose equivalent to an individual in excess of one mSv (0.1 rem) in one hour.

(C) Additional control devices shall be provided so that, upon failure of the entry control devices to function as required in this regulation, both of the following will occur:

(i) The radiation level within the area, from the source of radiation, is reduced below the level at which it would be possible for an individual to receive a deep dose equivalent in excess of one mSv (0.1 rem) in one hour.

(ii) Conspicuous visible and audible alarm signals are generated to make an individual attempting to enter the area aware of the hazard and at least one other authorized individual who is
physically present, familiar with the activity, and prepared to render
or summon assistance aware of the failure of the entry control
devices.

(D) The licensee or registrant shall provide control devices
so that, upon the failure or removal of physical radiation barriers
other than the sealed sources shielded storage container, both of the
following will occur:

(i) The radiation level from the source of radiation is reduced
below the level at which it would be possible for an individual to
receive a deep dose equivalent in excess of one mSv (0.1 rem) in
one hour.

(ii) Conspicuous visible and audible alarm signals are
generated to make potentially affected individuals aware of the
hazard and to make the licensee, registrant, or at least one other
individual who is familiar with the activity and prepared to render
or summon assistance aware of the failure or removal of the physical
barrier.

(E) If the shield for stored sealed sources is a liquid, the
licensee or registrant shall provide the means to monitor the
integrity of the shield and to automatically signal the loss of
adequate shielding.

(F) Physical radiation barriers that comprise permanent
structural components, including walls, that have no credible
probability of failure or removal in ordinary circumstances shall not
be required to meet the requirements of paragraphs (d)(3)(D) and
(E).

(G) Each area shall be equipped with devices that
automatically generate conspicuous visible and audible alarm
signals to alert personnel in the area before the source of radiation
can be put into operation and in time for any individual in the area
to operate a clearly identified control device, which shall be installed
in the area and which shall prevent the source of radiation from
being put into operation.

(H) Each area shall be controlled by the use of any
administrative procedures and devices necessary to ensure that the
area is cleared of personnel before each use of the source of
radiation.

(I) Each area shall be checked by a measurement of the
radiation to ensure that, before the first individual's entry into the
area after any use of the source of radiation, the radiation level from the source of radiation in the area is below the level at which it would be possible for an individual to receive a deep dose equivalent in excess of one mSv (0.1 rem) in one hour.

(J) The entry control devices required in paragraph (d)(3) shall be tested for proper functioning.

(i) Testing shall be conducted before initial operation with the source of radiation on any day, unless operations were continued uninterrupted from the previous day.

(ii) Testing shall be conducted before resuming operation of the source of radiation after any unintentional interruption.

(iii) The licensee or registrant shall submit and adhere to a schedule for periodic tests of the entry control and warning systems.

(K) The licensee or registrant shall not conduct operations, other than those necessary to place the source of radiation in safe condition or to effect repairs on controls, unless the control devices are functioning properly.

(L) Entry and exit portals that are used in transporting materials to and from the irradiation area and that are not intended for use by individuals shall be controlled by those devices and administrative procedures necessary to physically protect and warn against inadvertent entry by any individual through these portals. Exit portals for irradiated materials shall be equipped to detect and signal the presence of any loose radioactive material that is carried toward such an exit and automatically to prevent any loose radioactive material from being carried out of the area.

(4) Licensees, registrants, or applicants for licenses or registrations for sources of radiation subject to paragraph (d)(3) that will be used in a variety of positions or in locations including open fields or forests that make it impracticable to comply with certain requirements of this regulation, including those for the automatic control of radiation levels, may apply to the department for approval of alternative safety measures. Alternative safety measures that are at least equivalent to those specified in paragraph (d)(3) shall be provided. At least one of the alternative measures shall include an entry-preventing interlock control based on a measurement of the radiation that ensures the absence of high radiation levels before an individual can gain access to the area where such sources of radiation are used.
(e) Airborne radioactivity areas. Each airborne radioactivity area shall be conspicuously posted with a sign or signs bearing the radiation caution symbol and the following words:

CAUTION (or DANGER)

AIRBORNE RADIOACTIVITY AREA

(f) Additional requirements.

Each area or room in which any radioactive material is used or stored in an amount exceeding 10 times the quantity of radioactive material listed in appendix C in "appendices to part 4: standards for protection against radiation," as adopted by reference in K.A.R. 28-35-135a [p.3], shall be conspicuously posted with a sign or signs bearing the radiation caution symbol and the following words:

CAUTION (or DANGER)

RADIOACTIVE MATERIAL

(g) Containers.

(1) Except as otherwise provided in this subsection, each container of radioactive material shall bear a durable, clearly visible label identifying the radioactive contents.

(2) Each label required by paragraph (g) (1) shall bear the radiation caution symbol specified in paragraph (a) (1) and the following words:

CAUTION (or DANGER)

RADIOACTIVE MATERIAL

Each label shall also provide sufficient information to permit the individuals handling or using the containers, or working in the vicinity of the containers, to take precautions to avoid or minimize exposure. As appropriate, the label information may include radiation levels, description of the contents, an estimate of the activity, and the date for which the activity is estimated.

(3) The labeling required under paragraph (g) (1) of this regulation shall not be required for any of the following:

(A) Containers that do not contain radioactive material in quantities greater than the applicable quantities listed in appendix C
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in "appendices to part 4: standards for protection against radiation," which is adopted by reference in K.A.R. 28-35-135a [p.3];

(B) containers that do not contain radioactive material in concentrations greater than the applicable concentrations listed in appendix B, table I, column 2 in "appendices to part 4: standards for protection against radiation," which is adopted by reference in K.A.R. 28-35-135a [p.3];

(C) containers attended by an individual who takes the precautions necessary to prevent the exposure of any individual to radiation or radioactive material in excess of the limits established by these regulations;

(D) containers in transport and packaged and labeled in accordance with the U.S. department of transportation regulations;

(E) containers that are accessible only to individuals authorized to handle or use the containers or to work in the containers' vicinity, if the contents are identified to those individuals by a readily available written record, including containers in water-filled canals, storage vaults, hot cells, and similar locations; or

(F) manufacturing and process equipment, including piping and tanks.

(4) Before disposing of an empty uncontaminated container in an unrestricted area, each licensee shall remove or deface the radioactive material label or otherwise clearly indicate that the container no longer contains radioactive material.

(h) Each radiation machine shall be labeled in a manner cautioning individuals that radiation is produced when the machine is being operated. (Authorized by and implementing K.S.A. 48-1607; effective, T-85-43, Dec. 19, 1984; effective May 1, 1985; amended Sept. 20, 1993; amended Oct. 17, 1994; amended Dec. 30, 2005.)

28-35-220a. Exceptions from posting, labeling, and color requirements. (a) Notwithstanding the provisions of K.A.R. 28-35-219 [p.212], the posting of a caution sign shall not be required in an area or room containing radioactive material for periods of less than eight hours if both of the following conditions are met:

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(1) The material is constantly attended during those periods by an individual who takes the precautions necessary to prevent the exposure of any individual to radiation or radioactive material in excess of the limits established in this part.

(2) The area or room is subject to the licensee's or registrant's control.

(b) Notwithstanding the requirements of K.A.R. 28-35-219a [p.212], licensees and registrants shall be allowed to label sources, source holders, or device components containing sources of radiation that are subject to high temperatures, with conspicuously etched or stamped radiation caution symbols without a color requirement.

(c) The posting of a caution sign shall not be required in any room or other area in a hospital that is occupied by patients if either of the following occurs:

(1) A patient being treated with a permanent implant could be released from confinement pursuant to part 6.

(2) A patient being treated with a therapeutic radiopharmaceutical could be released from confinement pursuant to part 6.

(d) The posting of a caution sign shall not be required in any room or area because of the presence of a sealed source if the radiation levels at 30 centimeters from the surface of the sealed source or housing do not exceed 0.05 mSv (0.005 rem) per hour.

(e) The posting of a caution sign shall not be required in any room or area because of the presence of radiation machines used solely for diagnosis in the healing arts, dentistry, or podiatry. (Authorized by and implementing K.S.A. 48-1607; effective, T-85-43, Dec. 19, 1984; effective May 1, 1985; amended Sept. 20, 1993; amended Oct. 17, 1994; amended Dec. 30, 2005.)


28-35-221a. Procedures for picking up, transporting, receiving, and opening packages. (a)(1) Each licensee or registrant who expects to receive a package containing quantities of radioactive material in excess of the type A quantities specified in
K.A.R. 28-35-221b [p.224] shall meet one of the following requirements:

(A) If the package is to be delivered to the licensee's or registrant's facility by the carrier, make arrangements to receive the package when it is offered for delivery by the carrier; or

(B) If the package is to be picked up by the licensee or registrant at the carrier's terminal, make arrangements to receive notification from the carrier of the arrival of the package, at the time of arrival.

(2) Each licensee or registrant who picks up a package of radioactive material from a carrier's terminal shall pick up the package upon receipt of notification from the carrier of the arrival of the package.

(b) Each licensee or registrant shall ensure that external radiation levels around any package specified in subsection (a) and, if applicable, external radiation levels around the vehicle transporting the package do not exceed 200 millirems per hour (2 mSv/hr) at any point on the external surface of the package or vehicle at any time during transportation. The transport index shall not exceed 10.

(c)(1) For the purpose of this subsection, "exclusive use" shall have the meaning specified in 10 C.F.R. 71.4, dated January 1, 2015 and hereby adopted by reference.

(2) For each package specified in subsection (a) and transported in exclusive use, radiation levels external to the package may exceed the limits specified in subsection (d) but shall not exceed any of the following:

(A) 200 millirems per hour (2 mSv/hr) on the accessible external surface of the package unless the following conditions are met, in which case the limit shall be 1,000 millirems per hour (10 mSv/hr):

(i) The shipment is made in a closed transport vehicle. For the purposes of this subsection, "closed transport vehicle" shall mean a vehicle or conveyance equipped with a securely attached exterior enclosure that, during normal transportation, restricts the access of unauthorized persons to the cargo space containing a package specified in subsection (a). The enclosure can be either temporary or permanent and, in the case of packaged materials, can be the see-through type that limits access from top, sides, and bottom;
(ii) the package is secured so that its position within the closed transport vehicle remains fixed during transportation; and

(iii) no loading or unloading operations occur between the beginning and end of the transportation;

(B) 200 millirems per hour (2 mSv/hr) at any point on the outer surface of the closed transport vehicle, including the upper and lower surfaces, or for a flatbed-style closed transport vehicle with a personnel barrier, at any point on the vertical planes projected from the outer edges of the closed transport vehicle, on the upper surface of the load, and on the lower external surface of the closed transport vehicle;

(C) 10 millirems per hour (0.1 mSv/hr) at any point two meters from the vertical planes represented by the outer lateral surfaces of the closed transport vehicle, or, in the case of a flatbed-style closed transport vehicle, at any point two meters from the vertical planes projected from the outer edges of the closed transport vehicle; or

(D) two millirems per hour (0.02 mSv/hr) in any normally occupied positions in the closed transport vehicle, except that this paragraph shall not apply to private motor carriers if each person occupying any of these positions in the closed transport vehicle is provided with a personnel-monitoring device and training in accordance with K.A.R. 28-35-333 [p.329].

(d) Each licensee or registrant, upon receipt of any package of radioactive material, shall monitor the external surfaces of each package labeled with the U.S. department of transportation radioactive white I or radioactive yellow II or III labels, as specified in 49 C.F.R. 172.403 and 172.436-440, for radioactive contamination caused by leakage of the radioactive contents. Each licensee or registrant shall also monitor for radiation levels of each package containing quantities of radioactive materials that are equal to or more than the type A quantity specified in 10 C.F.R. part 71, appendix A, which is adopted by reference in K.A.R. 28-35-221b [p.224]. Each licensee or registrant shall monitor each package known to contain radioactive materials for radioactive contamination and radiation levels if there is evidence of degradation of package integrity. The monitoring shall be performed as soon as practicable after receipt, but not later than three hours after the package is received at the licensee's facility if received
during the licensee's normal working hours or three hours from the beginning of the next working day if received after normal working hours. The licensee or registrant shall immediately notify the final delivery carrier and, by telephone, the department under either of the following conditions:

(1) Removable radioactive surface contamination exceeds the following maximum permissible limits:

<table>
<thead>
<tr>
<th>Contaminant</th>
<th>Maximum Permissible Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beta and gamma emitters and</td>
<td></td>
</tr>
<tr>
<td>low-toxicity alpha emitters</td>
<td>4</td>
</tr>
<tr>
<td>All other alpha-emitting radionuclides</td>
<td>0.4</td>
</tr>
</tbody>
</table>

(2) External radiation levels exceed the limits specified in 10 C.F.R. part 71, appendix A, which is adopted by reference in K.A.R. 28-35-221b. [p.224].

(e) Each licensee or registrant shall establish and maintain procedures for safely opening packages in which radioactive material is received and shall ensure that these procedures are followed and any special instructions are followed for the type of package being opened.

(f) Each licensee or registrant transferring special form sources in vehicles owned or operated by the licensee or registrant to and from a work site shall be exempt from the contamination monitoring requirements of this regulation. However, the licensee or registrant shall not be exempt from the monitoring requirement in this regulation for measuring radiation levels that ensures that the source is still properly lodged in its shield. (Authorized by and implementing K.S.A. 48-1607; effective, T-85-43, Dec. 19, 1984; effective May 1, 1985; amended Sept. 20, 1993; amended Oct. 17, 1994; amended May 4, 2018.)

**28-35-221b. Appendix A; determination of A₁, A₂, and B quantities.** The provisions of 10 C.F.R. part 71, appendix A, as in effect on July 13, 2015, are hereby adopted by reference, with the changes specified in this regulation.(a) Wherever the term "commission" appears within 10 C.F.R. part 71, appendix A, that term shall be replaced with the term "department."

(b) In 10 C.F.R. part 71, appendix A, paragraph II (c) shall be replaced with the following text: "The licensee shall submit requests for prior approval, described under paragraphs II(a) and II(b) of this appendix, to the department." (Authorized by
(a) Each licensee or registrant shall secure from unauthorized removal or access all licensed or registered sources of radiation that are stored in controlled or unrestricted areas.

(b) Each licensee or registrant shall control, maintain constant surveillance of, and use devices or administrative procedures to prevent the unauthorized use of all licensed or registered radioactive material that is in an unrestricted area and that is not in storage.

(c) Each registrant shall maintain control of radiation machines that are in a controlled or unrestricted area and that are not in storage. (Authorized by and implementing K.S.A. 48-1607; effective, T-85-43, Dec. 19, 1984; effective May 1, 1985; amended Sept. 20, 1993; amended Oct. 17, 1994; amended Dec. 30, 2005.)

28-35-223a. Waste disposal; general requirements. (a) A licensee shall not dispose of any radioactive material except by one of the following means:

(1) By transferring the material to an authorized recipient as provided in K.A.R. 28-35-190a [p.148];

(2) pursuant to K.A.R. 28-35-214b [p.207], 28-35-223a (c)(1) [p.225], or 28-35-224a [p.232]; or

(3) by decay in storage.

(b) A person shall be specifically licensed or registered to receive waste containing licensed or registered material from other persons for any of the following:

(1) Treatment before disposal;

(2) treatment or disposal by incineration;

(3) decay in storage;
(4) disposal at a land disposal facility licensed pursuant to these regulations; or
(5) storage until transferred to a storage or disposal facility authorized to receive the waste.

(c)(1) Any person may apply to the secretary for consideration for approval of proposed procedures to dispose of radioactive material in a manner not otherwise authorized in this part. Each applicant shall include a description of the radioactive material, including the following:
(A) The quantities and kinds of radioactive material;
(B) the levels of radioactivity involved; and
(C) the proposed manner and conditions of disposal.

(2) The application, when appropriate, shall also include an analysis and evaluation of pertinent information concerning the following:
(A) A description of the waste containing the licensed or registered material to be disposed of, including the physical and chemical properties that have an impact on risk evaluation, and the proposed manner and conditions of waste disposal;
(B) the nature of the environment, including topographical, geological, meteorological, and hydrological characteristics;
(C) the usage of groundwater and surface waters in the general area;
(D) the nature and location of other potentially affected facilities; and
(E) the procedures to be observed to minimize the risk of unexpected or hazardous exposures.

(3) An application for a license to receive radioactive material from other persons for disposal on land not owned by a state or the federal government shall not be approved by the secretary.

(d)(1) Any licensee may dispose of the following licensed materials without regard to its radioactivity:
(A) 0.05 microcuries (1.850 kBq) or less of hydrogen-3 or carbon-14, per gram of medium used for liquid scintillation counting; and
(B) 0.05 microcuries or less of hydrogen-3 or carbon-14, per gram of animal tissue averaged over the weight of the entire animal. Tissue shall not be disposed of under this regulation in a manner that would permit its use either as food for humans or as animal feed.
(2) This regulation shall not exempt any licensee or registrant from the requirement to maintain records showing the receipt, transfer, and disposal of the radioactive material as specified in K.A.R. 28-35-227c [p.234].

(3) This regulation shall not exempt any licensee or registrant from the requirement to comply with other applicable federal, state, and local regulations governing any other toxic or hazardous property of waste materials. (Authorized by and implementing K.S.A. 48-1607; effective, T-85-43, Dec. 19, 1984; effective May 1, 1985; amended Sept. 20, 1993; amended Oct. 17, 1994; amended Dec. 30, 2005.)

28-35-223b. Waste classification. (a) Classification of waste for near surface disposal. In classifying radiation waste, consideration shall be given to the concentration of long-lived radionuclides (and their shorter-lived precursors) whose potential hazard will persist long after such precautions as institutional controls, improved waste form, and deeper disposal have ceased to be effective. Consideration shall also be given to the concentration of short-lived radionuclides for which requirements on institutional controls, waste form, and disposal methods are efficient.

(b) Classes of waste.

(1) "Class A waste" is waste that is segregated from other waste classes at the disposal site. The physical form and characteristics of class A waste shall meet the minimum requirements set forth in K.A.R. 28-35-223c(a). If class A waste also meets the stability requirements set forth in K.A.R. 28-35-223c(b) [p.231], the requirement that such wastes be separated shall be waived.

(2) "Class B waste" is waste that must meet more rigorous requirements as to waste form to insure stability after disposal. The physical form and characteristics of class B waste shall meet both the minimum and stability requirements set forth in K.A.R. 28-35-223c [p.230].

(3) "Class C waste" is waste that must meet more rigorous requirements as to waste form to insure stability and that also requires additional measures at the disposal facility to protect against inadvertent intrusion. The physical form and characteristics
of class C waste shall meet both the minimum and stability requirements set forth in K.S.A. 28-35-223c.

(4) "Waste that is not generally acceptable for near-surface disposal" is waste for which waste form and disposal methods must be different, and in general more stringent, than those specified for class C wastes. In the absence of specific requirements in this part, proposals for disposal of this waste may be submitted to the department for approval.

(c) Classification determined by long-lived radionuclides. If radioactive waste contains only radionuclides listed in Table 1, classification shall be determined as follows:

(1) If the concentration does not exceed 0.1 times the value in Table 1, the waste shall be assigned to Class A.

(2) If the concentration exceeds 0.1 times the value in Table 1, the waste shall be assigned to Class C.

(3) If the concentration exceeds the value in Table 1, the waste shall not be generally acceptable for near-surface disposal.

(4) For wastes containing mixtures of radionuclides listed in Table 1, the total concentration shall be determined by the sum of fractions rule described in subsection (g) of this regulation.

(d) Classification determined by short-lived radionuclides.

(1) If the radionuclides are not listed in Table 1, classification shall be determined based on the concentrations shown in Table 2. If a radionuclide is not listed in Table 2, it shall not be considered in determining waste classification.

(2) If the concentration does not exceed the value in Column 1 of Table 2, the waste shall be assigned to Class A.

(3) If the concentration exceeds the value in Column 1, Table 2, but does not exceed the value in Column 2, Table 2, the waste shall be assigned to Class B.

<table>
<thead>
<tr>
<th>Radionuclide</th>
<th>Concentration (Curies/M³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-14</td>
<td>8</td>
</tr>
<tr>
<td>C-14 in activated metal</td>
<td>80</td>
</tr>
<tr>
<td>Ni-59 in activated metal</td>
<td>220</td>
</tr>
<tr>
<td>Nb-94 in activated metal</td>
<td>0.2</td>
</tr>
<tr>
<td>Tc-99</td>
<td>3</td>
</tr>
<tr>
<td>Alpha emitting transuranic nuclides with half-life greater than 5 years</td>
<td>100*</td>
</tr>
<tr>
<td>Radionuclide</td>
<td>Concentration (Curies/M³)</td>
</tr>
<tr>
<td>--------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>Pu-241</td>
<td>3,500*</td>
</tr>
<tr>
<td>Cm-242</td>
<td>20,000</td>
</tr>
</tbody>
</table>

*Units are nanocuries per gram

**Table 2**

<table>
<thead>
<tr>
<th>Radionuclide</th>
<th>Column 1</th>
<th>Column 2</th>
<th>Column 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total of all nuclides with less than 5 year half-life</td>
<td>700</td>
<td>**</td>
<td>**</td>
</tr>
<tr>
<td>H-3</td>
<td>40</td>
<td>**</td>
<td>**</td>
</tr>
<tr>
<td>Co-60</td>
<td>700</td>
<td>**</td>
<td>**</td>
</tr>
<tr>
<td>Ni-63</td>
<td>3.5</td>
<td>70</td>
<td>700</td>
</tr>
<tr>
<td>Ni-63 inactivated metal</td>
<td>35</td>
<td>700</td>
<td>7000</td>
</tr>
<tr>
<td>Sr-90</td>
<td>0.04</td>
<td>150</td>
<td>7000</td>
</tr>
<tr>
<td>Cs-137</td>
<td>1</td>
<td>44</td>
<td>4600</td>
</tr>
</tbody>
</table>

**There are no limits established for these radionuclides in Class B or Class C wastes. Practical considerations such as the effects of external radiation and internal heat generation on transportation, handling, and disposal will limit the concentrations for these wastes. These wastes shall be Class B unless the concentration of other nuclides in Table 2 independently determine the waste to be Class C.**

(4) If the concentration exceeds the value in Column 2, Table 2, but does not exceed the value in Column 3, Table 2, the waste shall be assigned to Class C.

(5) If the concentration exceeds the value in Column 3, the waste is not generally acceptable for near-surface disposal.

(6) For wastes containing mixtures of the nuclides listed in Table 2, the total concentration shall be determined by the sum of fractions rule described in subsection (g) of this regulation.

(e) Classification determined by both long and short-lived radionuclides. If radioactive wastes contains a mixture of radionuclides, some of which are listed in Table 1, and some of
which are listed in Table 2, classification shall be determined as follows:

(1) If the concentration of a nuclide listed in Table 1 is less than 0.1 times the value listed in Table 1, the class shall be that determined by the concentration of nuclides listed in Table 2.

(2) If the concentration of a nuclide listed in Table 1 exceeds 0.1 times the value listed in Table 1, the waste shall be Class C, if the concentration of nuclides listed in Table 2 does not exceed the value shown in Column 3 of Table 2.

(f) Classification of wastes with radionuclides other than those listed in Tables 1 and 2. If radioactive waste does not contain any nuclides listed in either Table 1 or 2, it shall be assigned to Class A.

(g) The sum of the fractions rule for mixtures of radionuclides. For determining the classification of waste that contains a mixture of radionuclides, it is necessary to determine the sum of fractions by dividing each nuclide's concentration by the appropriate limit and adding the resulting values. The appropriate limits shall all be taken from the same column of the same table. The sum of the fractions for the column shall be less than 1.0 if the waste class is to be determined by that column.

(h) Determination of concentrations in wastes. The concentration of a radionuclide may be determined by indirect methods. Such methods may include use of scaling factors which relate the inferred concentration of one radionuclide to another that is measured, or radionuclide material accountability, if there is reasonable assurance that the indirect methods can be correlated with actual measurements. The concentration of a radionuclide may be averaged over the volume of the waste, or weight of the waste if the units are expressed as nanocuries per gram. (Authorized by and implementing K.S.A. 1984 Supp. 48-1607; effective, T-86-37, Dec. 11, 1985; effective May 1, 1986.)

28-35-223c. Waste characteristics. (a) The following requirements shall be the minimum requirements for all classes of waste:

(1) Radioactive wastes shall be packaged in conformance with the conditions of the license issued to the site operator to which the waste will be shipped. If the conditions of the site license are
more restrictive than the provisions of these regulations, the site license conditions shall govern.

(2) Wastes shall not be packaged for disposal in cardboard or fiberboard boxes.

(3) Liquid waste shall be packaged in sufficient absorbent material to absorb twice the volume of the liquid.

(4) Solid wastes containing liquid shall contain as little free standing and non-corrosive liquid as is reasonably achievable, but in no case shall the liquid exceed 1% of the volume.

(5) Waste shall not be readily capable of detonation or of explosive decomposition or reaction at normal temperatures and pressures, or of explosive reaction with water.

(6) Waste shall not contain, or be capable of generating, quantities of toxic gases, vapors, or fumes harmful to persons transporting, handling, or disposing of the waste. This requirement shall not apply to radioactive gaseous waste packaged in accordance with paragraph (8) of this subsection.

(7) Waste shall not be pyrophoric. Pyrophoric materials contained in wastes shall be treated, prepared, and packaged to be nonflammable.

(8) Wastes in a gaseous form shall be packaged at a pressure that does not exceed 1.5 atmospheres at 20º C. Total activity shall not exceed 100 curies per container.

(9) Wastes containing hazardous, biological, pathogenic, or infectious material shall be treated to reduce, to the maximum extent practicable, the potential hazard from the non-radiological materials.

(b) The requirements in this section are intended to provide stability of the waste:

(1) Waste shall have structural stability. A structurally stable waste form shall maintain its physical dimensions and its form, under the expected disposal conditions. Such proposed conditions may include weight of overburden and compaction equipment, the presence of moisture, and microbial activity, and internal factors, including radiation effects and chemical changes. Structural stability may be provided by the waste form itself, by processing the waste to a stable form, or by placing the waste in a disposal container or structure that provides stability after disposal.
(2) Notwithstanding the provisions of K.A.R. 28-35-223c(a)(2) and (3) [p.231], liquid wastes, or wastes containing liquid, shall be converted into a form that contains as little free-standing and noncorrosive liquid as reasonably achievable. In no case shall the liquid exceed 1% of the volume of the waste when the waste is in a disposal container designed to ensure stability, or 0.5% of the volume of the waste for waste processed to a stable form.

(3) Void spaces within the waste and between the waste and its package shall be reduced to the extent practicable. (Authorized by and implementing K.S.A. 1984 Supp. 48-1607; effective, T-86-37, Dec. 11, 1985; effective May 1, 1986.)

**28-35-223d. Labeling.** Each package of waste must be clearly labeled to identify whether it is Class A waste, Class B waste, or Class C waste, in accordance with K.A.R 28-35-223b. (Authorized by and implementing K.S.A. 1984 Supp. 48-1607; effective, T-86-37, Dec. 11, 1985; effective May 1, 1986.)


**28-35-224a. Disposal by release into sanitary sewage systems.** (a) A licensee shall not discharge radioactive material into a sanitary sewage system unless the following requirements are met:

1. The radioactive material shall be readily soluble or readily dispersible biological material, in water.

2. The quantity of any radioactive material released into the system by the licensee in any month shall not exceed the quantity that, if diluted by the average monthly quantity of sewage released into the sewer by the licensee, would result in an average concentration no greater than the limits specified in appendix B, table III, as published in "appendices to part 4: standards for protection against radiation," which is adopted by reference in K.A.R. 28-35-135a [p.3].

3. If more than one radionuclide is released, the following additional requirements shall be satisfied.

   (A) The licensee or registrant shall determine the fraction of the limit in appendix B, table III, as published in "appendices to part 4: standards for protection against radiation" and adopted in K.A.R. 28-35-135a [p.3], represented by discharges into sanitary sewerage
by dividing the actual monthly average concentration of each radionuclide released by the licensee or registrant into the sewer by the concentration of that radionuclide listed in appendix B, table III, as published in "appendices to part 4: standards for protection against radiation."

(B) The sum of the fractions for each radionuclide required by paragraph (a)(3)(A) shall not exceed one.

(4) The total quantity of licensed or registered radioactive material that the licensee or registrant releases into the sanitary sewerage in a year shall not exceed 185 Gbq (5 Ci) of hydrogen-3, 37 Gbq (1 Ci) of carbon-14, and 37 Gbq (1 Ci) of all other radioactive materials combined.

(b) A licensee shall not discharge radioactive material into an individual sewage disposal system used for the treatment of waste water serving only a single dwelling, office building, industrial plant, or institution except as specifically approved by the secretary pursuant to K.A.R. 28-35-214a [p.206] and 28-35-223a(c) [p.225].

(c) Excreta from individuals undergoing medical diagnosis or therapy with radioactive material shall be exempt from any limitations contained in this regulation. (Authorized by and implementing K.S.A. 48-1607; effective, T-85-43, Dec. 19, 1984; effective May 1, 1985; amended Sept. 20, 1993; amended Oct. 17, 1994; amended Dec. 30, 2005.)


28-35-227b. General provisions. (a) Each licensee or registrant shall use the SI units becquerel, gray, sievert and coulomb per kilogram, or the special unit curie, rad, rem, and roentgen, including multiples and subdivisions, and shall clearly indicate the units of all quantities on records required by these regulations.
(b) Each licensee or registrant shall make a clear distinction among the quantities entered on the records required by these regulations, including total effective dose equivalent, total organ dose equivalent, shallow dose equivalent, eye dose equivalent, deep dose equivalent, or committed effective dose equivalent. (Authorized by and implementing K.S.A. 1993 Supp. 48-1607; effective Oct. 17, 1994.)

28-35-227c. Records of radiation protection programs. (a) Each licensee or registrant shall maintain records of the radiation protection program, including:
(1) the provisions of the program; and
(2) audits and other reviews of program content and implementation.
(b) The licensee or registrant shall retain the records required by K.A.R. 28-35-227c(a)(1) [p.234] until the department terminates each pertinent license or registration requiring the record. The licensee or registrant shall retain the records required by K.A.R. 28-35-227c(a)(2) [p.234] for three years after the record is made. (Authorized by and implementing K.S.A. 1993 Supp. 48-1607; effective Oct. 17, 1994.)

28-35-227d. Records of surveys. (a) Each licensee or registrant shall maintain records showing the results of surveys and calibrations required by K.A.R. 28-35-217b [p.211] and K.A.R. 28-35-221a(b) [p.222]. Each licensee or registrant shall retain each of these records for three years after the record is made.

(b) Each licensee or registrant shall retain each of the following records until the secretary terminates each pertinent license or registration requiring the record:

1. Records of 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 dose equivalents;

2. records of the results of measurements and calculations used to determine individual intakes of radioactive material and used in the assessment of internal dose;

3. records showing the results of air sampling, surveys, and bioassays required pursuant to K.A.R. 28-35-212g [p.202]; and

4. records of the results of measurements and calculations used to evaluate the release of radioactive effluents to the environment. (Authorized by and implementing K.S.A. 48-1607; effective Oct. 17, 1994; amended Dec. 30, 2005.)

28-35-227e. Records of tests for leakage or contamination of sealed sources. A record of each test for leakage or contamination of sealed sources shall be kept in units of becquerel or microcurie and maintained for inspection by the department for five years after the record is made. (Authorized by and implementing K.S.A. 1993 Supp. 48-1607; effective Oct. 17, 1994.)

28-35-227f. Records of prior occupational dose. Each licensee or registrant shall retain the records of prior occupational
28-35-227g. Records of planned special exposures. (a) For each use of the provisions of K.A.R. 28-35-212f [p.200] for planned special exposures, each licensee or registrant shall maintain records that describe the following:

(1) The exceptional circumstances requiring the use of a planned special exposure;
(2) the name of the management official who authorized the planned special exposure and a copy of the signed authorization;
(3) any actions that were necessary;
(4) the reason why the actions were necessary;
(5) the precautions that were taken to ensure that doses were maintained ALARA;
(6) the expected individual and collective doses; and
(7) the doses actually received in the planned special exposure.

(b) Each licensee or registrant shall retain the records of a planned special exposure until the department terminates each pertinent license or registration requiring these records. (Authorized by and implementing K.S.A. 48-1607; effective Oct. 17, 1994; amended Dec. 30, 2005.)

28-35-227h. Records of individual monitoring results. (a) Each licensee or registrant shall maintain records of the doses received by all individuals for whom monitoring was required pursuant to K.A.R. 28-35-217a [p.210] and records of the doses received during planned special exposures, accidents, and emergency conditions. Assessments of dose equivalent and records made using units in effect before January 1, 1994 shall not be required to be changed. These records shall include the following, when applicable:
(1) The deep dose equivalent to the whole body, eye dose equivalent, shallow dose equivalent to the skin, and shallow dose equivalent to the extremities;

(2) the estimated intake of radionuclides;

(3) the committed effective dose equivalent assigned to the intake of radionuclides;

(4) the specific information used to calculate the committed effective dose equivalent pursuant to K.A.R. 28-35-212d(c) [p.196];

(5) the total effective dose equivalent when required by K.A.R. 28-35-212b [p.195]; and

(6) the total of the deep dose equivalent and the committed dose to the organ receiving the highest total dose.

(b) Each licensee or registrant shall make entries of the records specified in subsection (a) at least annually.

(c) Each licensee or registrant shall maintain the records specified in subsection (a) either on a form approved by the department and in accordance with the instructions from the department or in clear and legible records containing all the information required by the department-approved form.

(d) Each licensee or registrant shall maintain the records of dose to each embryo or fetus with the records of dose to the declared pregnant woman. The declaration of pregnancy, including the estimated date of delivery, shall also be kept on file, but may be maintained separately from the dose records.

(e) Each licensee or registrant shall retain each required form or record until the department terminates each pertinent license or registration requiring the record. (Authorized by and implementing K.S.A. 48-1607; effective Oct. 17, 1994; amended Dec. 30, 2005.)

28-35-227i. Records of dose to individual members of the public. (a) Each licensee or registrant shall maintain records sufficient to demonstrate compliance with the dose limit for individual members of the public.

(b) The licensee or registrant shall retain the records required by K.A.R. 28-35-227i(a) [p.237] until the department terminates each pertinent license or registration requiring the record. (Authorized by and implementing K.S.A. 1993 Supp. 48-1607; effective Oct. 17, 1994.)
28-35-227j. Records of waste disposal. (a) Each licensee or registrant shall maintain records of the disposal of licensed or registered materials made pursuant to K.A.R. 28-35-223a [p.225], 28-35-223e, 28-35-224a [p.232], 28-35-225a [p.233], or 28-35-226a [p.234], and disposal by burial in soil, including burials authorized by these regulations before May 1, 1986.

(b) Each licensee or registrant shall retain the records required by subsection (a) until the secretary terminates each pertinent license or registration requiring the record. (Authorized by and implementing K.S.A. 48-1607; effective Oct. 17, 1994; amended Dec. 30, 2005.)

28-35-227k. Records of testing entry control devices for very high radiation areas. (a) Each licensee or registrant shall maintain records of tests made pursuant to K.A.R. 28-35-219a(d)(3)(J) [p.212] on entry control devices for very high radiation areas. These records shall include the date, time, and results of each test of function.

(b) The licensee or registrant shall retain the records required by K.A.R. 28-35-227k(a) [p.238] for three years after the record is made. (Authorized by and implementing K.S.A. 1993 Supp. 48-1607; effective Oct. 17, 1994.)

28-35-227l. Form of records. (a) Each record required by these regulations shall be legible throughout the specified retention period.

(1) 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.

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

(b) Records, including documents, letters, drawings, and specifications, shall include all pertinent information, including any stamps, initials, and signatures.

(c) The licensee shall maintain adequate safeguards against tampering with and loss of records. (Authorized by and implementing K.S.A. 1993 Supp. 48-1607; effective Oct. 17, 1994.)

28-35-228a. Reports of theft or loss of sources of radiation. (a) Each licensee or registrant shall report by telephone, telegraph, electronic mail, or facsimile to the department the theft or loss of the following sources of radiation immediately after the occurrence becomes known to the licensee or registrant:

(1) Stolen, lost, or missing licensed or registered radioactive material in an aggregate quantity equal to or greater than 1,000 times the quantity specified in appendix C in "appendices to part 4: standards for protection against radiation," as adopted by reference in K.A.R. 28-35-135a [p.3], if an exposure could result to individuals in unrestricted areas; or

(2) a stolen, lost, or missing radiation machine.

(b) The licensee or registrant shall also submit a report, in writing, within 30 days after learning of stolen, lost, or missing sources of radiation described in paragraph (a)(1) or (2).

(c) The licensee or registrant shall submit a report, in writing, within 30 days after learning of any stolen, lost, or missing licensed or registered radioactive material in an aggregate quantity greater than 10 times the quantity specified in appendix C in "appendices to part 4: standards for protection against radiation" that is still missing.

(d) Each licensee or registrant required to make a report pursuant to this regulation shall, within 30 days after making the telephone, telegraph, electronic mail, or facsimile report, submit a written report to the department that provides all of the following information:

(1) A description of the licensed or registered source of radiation involved, including, for radioactive material, the kind, quantity, and chemical and physical form and, for radiation machines, the manufacturer, model and serial numbers, and the type and maximum energy of radiation emitted;

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

(3) a statement of the disposition, or probable disposition, of the licensed or registered source of radiation involved;
(4) for any exposure of an individual to radiation, the circumstances under which the exposure occurred and the possible total effective dose equivalent to individuals in unrestricted areas;
(5) the actions that have been taken, or will be taken, to recover the source of radiation; and
(6) the procedures or measures that have been, or will be, adopted to ensure against a recurrence of the loss or theft of licensed or registered sources of radiation.

(e) After filing the written report, the licensee or registrant shall also report to the department, within 30 days of the date on which the information becomes available, any substantive additional information on the theft or loss that becomes available.

(f) Each licensee or registrant shall prepare any report filed with the department pursuant to this regulation so that the names of individuals who could have received exposure to radiation are stated in a separate and detachable portion of the report. (Authorized by and implementing K.S.A. 48-1607; effective, T-85-43, Dec. 19, 1984; effective May 1, 1985; amended Sept. 20, 1993; amended Oct. 17, 1994; amended Dec. 30, 2005.)


28-35-229a. Notification of incidents. (a) Immediate notification. Each licensee or registrant shall immediately notify the department by telephone, telegraph, mailgram or facsimile of any incident involving any source of radiation possessed by the licensee or registrant which may have caused or threatens to cause:

(1) (A) a total effective dose equivalent to any individual of 25 rems (250 mSv) or more of radiation;
    (B) an eye dose equivalent to any individual of 75 rems (.75 Sv) or more of radiation; or
    (C) a shallow dose equivalent to the skin or extremities or a total organ dose equivalent to any individual of 250 rad (2.5 Gy) or more of radiation; or
(2) the release of radioactive material, inside or outside of a restricted area, so that, had an individual been present for 24 hours, the individual could have received an intake five times the occupational ALI. This provision does not apply to locations where
personnel are not normally stationed during routine operations, such as hot-cells or process enclosures.

(b) Twenty-four hour notification. Each licensee or registrant shall, within 24 hours of the discovery of the event notify the department by telephone, telegraph, mailgram or facsimile of any incident involving any source of radiation possessed by the licensee or registrant which may have caused or threatens to cause:

(1) (A) a total effective dose equivalent to any individual exceeding five rems (50 mSv);
    (B) an eye dose equivalent exceeding 15 Rem (0.15 Sv); or
    (C) a shallow dose equivalent to the skin or to the extremities or a total organ dose equivalent exceeding 50 Rem (0.5 Sv); or

(2) the release of radioactive material, inside or outside of a restricted area, so that, had an individual been present for 24 hours, the individual could have received an intake in excess of one occupational ALI. This provision shall not apply to locations where personnel are not normally stationed during routine operations, such as hot-cells or process enclosures.

(c) Each report filed with the department pursuant to this regulation shall be prepared in such a manner that names of individuals who have received excessive doses are stated in a separate and detachable portion of the report.


28-35-230a. Reports of overexposures and excessive levels and concentrations. (a) In addition to any notification required by K.A.R. 28-35-229a [p.240], each licensee or registrant shall submit a report to the department, in writing, within 30 days of learning of any of the following occurrences:


(3) each incident in which levels of radiation or concentrations of radioactive material in a restricted area exceeded any other applicable limit in the license;

(4) any incident for which notification is required by K.A.R. 28-35-229a [p.240]; and

(5) each incident in which levels of radiation or concentrations of radioactive material in an unrestricted area exceeded 10 times any applicable limit set forth in this part or in the license, whether or not involving excessive exposure of any individual.

(6) For licensees subject to the provisions of the U.S. environmental protection agency's generally applicable environmental radiation standards in 40 CFR part 190, levels of radiation or releases of radioactive material in excess of those standards, or of license conditions related to those standards.

(b) Each report required under this regulation shall describe the extent of exposure of individuals to radiation or to radioactive material, including the following:

(1) The estimate of each individual's dose;

(2) the levels of radiation and concentrations of radioactive material involved;

(3) the cause of the exposure or excessive levels or concentrations; and

(4) the corrective steps taken or planned to ensure against a reoccurrence.

(c) Each report filed with the department under this regulation shall include for each individual exposed the individual's name, social security number, and date of birth, and an estimate of the individual's dose. With respect to the limit for the embryo or fetus specified in K.A.R. 28-35-213b [p.205], the identifiers shall be those of the declared pregnant woman. The report shall be prepared
so that the identifier are stated in a separate and detachable part of the report. (Authorized by and implementing K.S.A. 48-1607; effective, T-85-43, Dec. 19, 1984; effective May 1, 1985; amended Sept. 20, 1993; amended Oct. 17, 1994; amended Dec. 30, 2005.)


28-35-230c. Reports of planned special exposures. The licensee or registrant shall submit a written report to the department within 30 days following any planned special exposure conducted in accordance with K.A.R. 28-35-212f [p.200], which shall inform the department that a planned special exposure was conducted, indicate the date the planned special exposure occurred and contain the information required by K.A.R. 28-35-227g [p.236]. (Authorized by and implementing K.S.A. 1993 Supp. 48-1607; effective Oct. 17, 1994.)


28-35-230e. Notifications and reports to individuals. (a) When a licensee or registrant is required pursuant to K.A.R. 28-35-230a [p.241] to report to the department any exposure of an individual to radiation or radioactive material, the licensee or registrant shall also notify the individual.

(b) Notice to the individual shall be transmitted at a time not later than the transmittal to the department, and shall comply with the provisions of K.A.R. 28-35-334 [p.331] of these regulations. (Authorized by and implementing K.S.A. 1993 Supp. 48-1607; effective Oct. 17, 1994.)

28-35-230f. Reports of leaking or contaminated sealed sources. If a test for leakage or contamination pursuant to K.A.R. 28-35-216a [p.208] indicates a sealed source is leaking or contaminated, a report of the test shall be filed within five days with the department describing the equipment involved, the test results

28-35-230g. Reports of transactions involving nationally tracked sources. (a) Each licensee who manufactures a nationally tracked source shall submit a report on each nationally tracked source containing the following information:

(1) The name, address, and license number of the reporting licensee;
(2) the name of the individual preparing the report;
(3) the manufacturer, the model, and the serial number of the source;
(4) the radioactive material in the source;
(5) the initial source strength in becquerels or curies at the time of manufacture; and
(6) the manufacture date of the source.

(b) Each licensee that transfers a nationally tracked source to another person shall submit a report on each nationally tracked source containing the following information:

(1) The name, address, and license number of the reporting licensee;
(2) the name of the individual preparing the report;
(3) the name and license number of the recipient facility and the shipping address;
(4) the manufacturer, the model, and the serial number of the source or, if not available, other information to uniquely identify the source;
(5) the radioactive material in the source;
(6) the initial or current source strength, in becquerels or curies;
(7) the date for which the source strength is reported;
(8) the shipping date;
(9) the estimated arrival date; and
(10) for nationally tracked sources transferred as waste under a uniform low-level radioactive waste manifest, the waste manifest number and the container identification.

(c) Each licensee that receives a nationally tracked source shall submit a report on each nationally tracked source containing the following information:
(1) The name, address, and license number of the reporting licensee;
(2) the name of the individual preparing the report;
(3) the name, address, and license number of the person that provided the source;
(4) the manufacturer, the model, and the serial number of the source or, if not available, other information to uniquely identify the source;
(5) the radioactive material in the source;
(6) the initial or current source strength, in becquerels or curies;
(7) the date for which the source strength is reported;
(8) the date of receipt; and
(9) for material received under a uniform low-level radioactive waste manifest, the waste manifest number and the container identification.

(d) Each licensee that disassembles a nationally tracked source shall submit a report on each nationally tracked source containing the following information:
(1) The name, address, and license number of the reporting licensee;
(2) the name of the individual preparing the report;
(3) the manufacturer, the model, and the serial number of the source or, if not available, other information to uniquely identify the source;
(4) the radioactive material in the source;
(5) the initial or current source strength, in becquerels or curies;
(6) the date for which the source strength is reported; and
(7) the date on which the source was disassembled.

(e) Each licensee who disposes of a nationally tracked source shall submit a report on each nationally tracked source containing the following information:
(1) The name, address, and license number of the reporting licensee;
(2) the name of the individual preparing the report;
(3) the waste manifest number;
(4) the container identification;
(5) the date of disposal; and
(6) the method of disposal.

(f) The reports required in subsections (a) through (e) shall be submitted by the close of the next business day after the transaction. A single report may be submitted for multiple sources and transactions. The reports shall be submitted to the nuclear regulatory commission's national source tracking system by one of the following means:

(1) The nuclear regulatory commission's on-line national source tracking system;

(2) electronic transmission, using a computer-readable format;

(3) facsimile;

(4) mail, sent to the address specified on the nuclear regulatory commission's national source tracking transaction report form; or

(5) telephone, with follow-up by facsimile or mail.

(g) Each licensee shall correct any error in previously filed reports or file a new report for any missed transaction within five business days of the discovery of the error or missed transaction. These errors can be detected by methods that may include administrative reviews or physical inventories required by these regulations.

(h) Each licensee shall reconcile the inventory of nationally tracked sources possessed by the licensee against that licensee's data in the national source tracking system. The reconciliation shall be conducted during the month of January in each year. The reconciliation process shall include resolving any discrepancies between the national source tracking system and the actual inventory by filing the reports required by subsections (a) through (e). Each licensee shall submit, to the national source tracking system, confirmation that the data in the national source tracking system is correct. This confirmation shall be submitted on or before January 31 of each year.

(i) Each licensee that possesses category 1 nationally tracked sources shall report its initial inventory of category 1 nationally tracked sources to the national source tracking system on or before November 15, 2007. Each licensee that possesses category 2 nationally tracked sources shall report its initial inventory of category 2 nationally tracked sources to the national source tracking system on or before November 30, 2007. The information may be
submitted by using any of the methods specified in subsection (f). The initial inventory report shall include the following information:

(1) The name, address, and license number of the reporting licensee;
(2) the name of the individual preparing the report;
(3) the manufacturer, model, and serial number of each nationally tracked source or, if not available, other information to uniquely identify the source;
(4) the radioactive material in the sealed source;
(5) the initial or current source strength in becquerels or curies; and
(6) the date for which the source strength is reported.

(j) Compliance with the reporting requirements of this regulation shall be required on or before November 15, 2007 for category 1 sources and on or before November 30, 2007 for category 2 sources. (Authorized by and implementing K.S.A. 48-1607; effective July 27, 2007.)


28-35-231a. Vacating installations. (a) Notification. Each licensee, before vacating any installation that could have been contaminated by radioactive material as a result of the licensee's activities, shall notify the department in writing of the intent to vacate, at least 30 days before vacating. Any licensee may be required by the secretary to decontaminate, or have decontaminated, the installation to a degree consistent with subsequent use as an uncontrolled area.

(b) Decommissioning timeliness.
(1) Each licensee in possession of a nonexempt source of radiation who decides to terminate all activities involving that source of radiation shall notify the department immediately, in writing.

(2) Each licensee responsible for a facility or site that includes a nonexempt source of radiation or that could be contaminated by residual radioactivity shall notify the department, in writing, of the intent to vacate, at least 30 days before vacating or relinquishing possession or control of the facility or site.
(3) Each licensee shall notify the department, in writing, within 60 days of the occurrence of any of the following:

(A) The licensee has decided to permanently cease principal operations at the entire site or in any separate building or outdoor area with residual radioactivity that renders the building or outdoor area unsuitable for uncontrolled use in accordance with these regulations.

(B) No principal operations under the license have been conducted during the previous 24 months.

(C) No principal operations have been conducted during the previous 24 months in any separate building or outdoor area with residual radioactivity that renders the building or outdoor area unsuitable for uncontrolled use in accordance with these regulations.

(4) From the date of notification of the department as required in subsections (a) and (b) of this regulation, the licensee shall perform either one of the following:

(A) Begin decommissioning activities; or

(B) within 12 months of notification, submit a decommissioning plan, if required by K.A.R. 28-35-204 [p.183], and begin decommissioning upon the approval of that plan.

(5) Coincident with the notification of the department required in subsections (a) and (b) of this regulation, the licensee shall maintain in effect all decommissioning financial assurances established by the licensee in conjunction with a license issuance or renewal or as required by this part. The amount of the financial assurance shall be increased, or may be decreased, in order to cover the detailed cost estimate for decommissioning, as specified in K.A.R. 28-35-204 [p.183].

(6) An alternate schedule may be approved by the secretary for the submission of plans and for the completion of decommissioning required by this regulation if the secretary determines that both of the following conditions are met:

(A) An alternative schedule is necessary to effectively conduct decommissioning.

(B) An alternative schedule either presents no undue risks to public health and safety or is otherwise in the public interest.

The schedule for decommissioning shall not commence until the secretary has made a determination on the request. (Authorized by and implementing K.S.A. 48-1607; effective, T-85-43, Dec. 19, 1984; effective May 1, 1985; amended Dec. 30, 2005.)


Part 5. Use of X-Rays in the Healing Arts
28-35-241. Applicability. This part shall establish requirements for the diagnostic use of X-rays in medicine, dentistry, osteopathy, chiropractic, podiatry, and veterinary medicine. The provisions of this part shall be in addition to, and not in substitution for, the other applicable provisions of these regulations. (Authorized by and implementing K.S.A. 48-1607; effective Jan. 1, 1970; amended Dec. 30, 2005.)

28-35-242. General requirements. (a) Waiver of requirements. Compliance with the specific requirements of these regulations relative to an existing machine or installation may be waived by the secretary if the registrant provides an alternative to the requirement that provides radiation protection equal to that prescribed in part 4 of these regulations.

(b) Responsibility to meet requirements. A person shall not make, sell, lease, transfer, lend, or install X-ray or fluoroscopic equipment, or the supplies used in connection with this equipment, unless both of the following conditions are met:

1) Those supplies and equipment, when properly placed in operation and properly used, will meet the requirements of parts 1, 4, and 5 and the applicable regulations under parts 7, 8, and 10 of these regulations.

2) The person delivers, if applicable, cones or collimators, filters, appropriate timers, and fluoroscopic shutters.

(c) Limitations on human use. An individual shall not be exposed to the useful beam, unless the exposure is for healing arts purposes and each exposure has been authorized by one of the following:

1) A licensed practitioner of the healing arts;

2) a physician assistant licensed by the state board of healing arts, when working under the supervision and direction of a person licensed to practice medicine or surgery;

3) an advanced registered nurse practitioner who holds a certificate of qualification from the state board of nursing, when working under the supervision and direction of a person licensed to practice medicine or surgery; or

4) an individual licensed to practice dentistry or podiatry within the authority granted to the individual by Kansas licensing laws applying to dentists and podiatrists.
(d) Prohibited uses. Deliberate exposure for the following purposes shall be specifically prohibited:

(1) Exposure of an individual for patient positioning, training, demonstration, or other purposes, unless a healing arts purpose exists and a proper prescription has been provided; and

(2) exposure of an individual for the purpose of healing arts screening without the prior written approval of the department, except mammography screening, if the facility is certified to perform mammography by the food and drug administration. Each person requesting approval for healing arts screening shall submit the information outlined in K.A.R. 28-35-255 [p.289]. Each person requesting approval for a healing arts screening shall notify the department within 30 days if any of the information submitted becomes invalid or outdated. (Authorized by and implementing K.S.A. 48-1607; effective Jan. 1, 1970; amended Jan. 1, 1972; amended May 1, 1976; amended Sept. 20, 1993; amended Dec. 30, 2005; amended March 18, 2011.)

28-35-242a. Administrative requirements. (a) Radiation safety requirements. Each registrant shall be responsible for directing the operation of each X-ray system under the registrant's administrative control. The registrant or the registrant's agent shall ensure that the requirements of this part, which shall include the following requirements, are met.

(1) An X-ray system not meeting the provisions of these regulations shall not be operated for diagnostic purposes.

(2) Each individual who operates any X-ray system shall be instructed in the safe operating procedures and shall be competent in the safe use of the equipment. This instruction shall include the relevant topics specified in K.A.R. 28-35-256 [p.290]. Any combination of interview, observation, and testing may be used by the secretary to determine compliance. Each individual that operates an X-ray system shall be licensed if required by the board of healing arts.

(3) A chart shall be made available to the operator of each diagnostic X-ray system that specifies, for each examination performed with the system, the following information:
(A) The technique factors to be utilized, taking into account the patient's body part and anatomical size, body part thickness, and age;

(B) the type and size of the film or film-screen combination to be used;

(C) the type and focal distance of the grid to be used, if any;

(D) the source-image receptor distance to be used, except for dental intraoral radiography; and

(E) the type and placement of patient shielding to be used.

(4) The registrant of a facility shall create and make available to all X-ray operators written safety procedures, including patient holding procedures and any restrictions on the operating techniques required for the safe operation of the particular X-ray system. The registrant shall ensure that the operator demonstrates familiarity with these procedures.

(5) Except for patients who cannot be moved out of the room, only the staff, ancillary personnel, and any other individuals required for the medical procedure or training shall be in the room during the radiographic exposure. All of the following requirements shall be met for each individual other than the patient being examined:

(A) Each individual shall be positioned so that no part of the body will be struck by the useful beam unless the body part is protected by not less than 0.5 millimeter of lead-equivalent material.

(B) The X-ray operator, other staff, ancillary personnel, and all other individuals required for the medical procedure shall be protected from the direct scattered radiation by protective aprons or whole-body protective barriers of not less than 0.25 millimeter of lead-equivalent material.

(C) All human patients who cannot be removed from the room shall be protected from the direct scattered radiation by whole-body protective barriers of not less than 0.25 millimeter of lead-equivalent material or shall be positioned so that the nearest portion of the body is at least two meters from both the tube head and the nearest edge of the image receptor.

(6) Gonad shielding of not less than 0.5 millimeter of lead-equivalent material shall be used during radiographic procedures in which the gonads are in the useful beam for all human patients who have not passed the reproductive age, except for cases in which this shielding would interfere with the diagnostic procedure.
(7) If a patient or film requires auxiliary support during a radiation exposure, all of the following safety requirements shall be met:

(A) Mechanical holding devices shall be used when the technique permits the use of these devices. The written safety procedures required by this regulation shall list the individual techniques for which holding devices cannot be utilized.

(B) The written safety procedures required by this regulation shall indicate the requirements for selecting a human holder and the procedure that the holder shall follow.

(C) The human holder shall be instructed in personal radiation safety and shall be protected in accordance with these regulations.

(D) No individual shall be used routinely to hold film or patients.

(E) If the patient holds the film, each portion of the body other than the area of clinical interest struck by the useful beam shall be protected by not less than 0.5 millimeter of lead-equivalent material, except during intraoral examinations.

(F) Each facility shall have a sufficient number of leaded aprons and gloves available to provide protection to all personnel who are involved with X-ray operations and who are otherwise not shielded.

(8) The procedures and auxiliary equipment designed to minimize patient and personnel exposure shall be commensurate with the needed diagnostic information and shall be utilized according to all of the following requirements:

(A) The speed of the screen and film combinations used shall be the fastest speed that is consistent with the diagnostic objective of the examinations. Film cassettes without intensifying screens shall not be used for any routine diagnostic imaging, with the exception of veterinary radiography and standard film packets for intraoral use in dental radiography.

(B) The radiation exposure to the patient shall be the minimum exposure required to produce images of good diagnostic quality.

(C) Portable or mobile X-ray equipment shall be used only for examinations during which transferring the patient or patients to a stationary X-ray installation is impractical.
(D) X-ray systems other than fluoroscopic dental intraoral systems and computed tomography X-ray systems shall not be utilized in any procedure in which the source-to-patient distance is less than 30 centimeters, unless specifically approved by the FDA. Veterinary systems shall not be subject to this limitation.

(E) If grids are used between the patient and the image receptor to decrease the amount of scattered radiation to the film and improve contrast, the grid shall be as follows:

(i) Positioned properly, including the tube side facing the right direction, with the grid centered to the central ray; and

(ii) if of the focused type, positioned at the proper focal distance for the SIDs being used.

(9) Each individual who is associated with the operation of an X-ray system shall be subject to the requirements of part 4 of these regulations.

(b) Records. Each registrant shall maintain the following minimum information for each X-ray system, for inspection by the department:

(1) The maximum rating of technique factors;

(2) the model and serial numbers of all certifiable components;

(3) the aluminum-equivalent filtration of the useful beam, including any routine variation;

(4) tube rating charts and cooling curves;

(5) records of surveys, calibrations, maintenance, and modifications performed on the X-ray system after the effective date of this regulation, with the name of each person who performed these services;

(6) a scale drawing of the room in which a stationary X-ray system is located, indicating the use of areas adjacent to the room and an estimation of the extent of occupancy by any individuals in these areas. In addition, the drawing shall include one of the following:

(A) The results of a survey for radiation levels present at the operator's position and at pertinent points outside the room at specified test conditions; or

(B) the type of thickness of materials, or lead equivalency, of each system; and

(7) a copy of all correspondence with the department regarding that X-ray system.
(c) X-ray utilization log. Except for veterinary facilities, each registrant shall maintain an X-ray log containing each patient's identifier, the type of each examination, and the date on which each examination was performed. When the patient or film is provided with human auxiliary support, the name of the human holder shall be recorded.

(d) X-ray film-processing facilities and practice.

(1) Each facility using a radiographic X-ray system and analog image receptors shall have available suitable equipment for handling and processing radiographic film in accordance with all of the following requirements:

(A) Each manual film-developing system shall meet all of the following requirements:

(i) The processing tanks shall be constructed of mechanically rigid, corrosion-resistant material.

(ii) The temperature of the solutions in the tanks shall be maintained within the range of 60° F to 80° F. All film shall be developed in accordance with the time-temperature relationships recommended by the film manufacturer or, in the absence of these recommendations, with the following time-temperature chart:

**Time-Temperature Chart**

<table>
<thead>
<tr>
<th>Thermometer Reading (Degrees)</th>
<th>Minimum Developing Time (Minutes)</th>
<th>°C</th>
<th>°F</th>
</tr>
</thead>
<tbody>
<tr>
<td>26.7</td>
<td>2</td>
<td>80</td>
<td>79</td>
</tr>
<tr>
<td>26.1</td>
<td>2</td>
<td>79</td>
<td>78</td>
</tr>
<tr>
<td>25.6</td>
<td>2 ½</td>
<td>78</td>
<td>77</td>
</tr>
<tr>
<td>25.0</td>
<td>3</td>
<td>77</td>
<td>76</td>
</tr>
<tr>
<td>24.4</td>
<td>3</td>
<td>76</td>
<td>75</td>
</tr>
<tr>
<td>23.9</td>
<td>3</td>
<td>75</td>
<td>74</td>
</tr>
<tr>
<td>23.3</td>
<td>3 ½</td>
<td>74</td>
<td>73</td>
</tr>
<tr>
<td>22.8</td>
<td>3 ½</td>
<td>73</td>
<td>72</td>
</tr>
<tr>
<td>22.2</td>
<td>4</td>
<td>72</td>
<td>71</td>
</tr>
<tr>
<td>21.7</td>
<td>4</td>
<td>71</td>
<td>70</td>
</tr>
<tr>
<td>21.1</td>
<td>4 ½</td>
<td>70</td>
<td>69</td>
</tr>
<tr>
<td>20.6</td>
<td>5</td>
<td>69</td>
<td>68</td>
</tr>
<tr>
<td>20.0</td>
<td>5 ½</td>
<td>68</td>
<td>67</td>
</tr>
</tbody>
</table>

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(iii) Devices shall be utilized that indicate the actual temperature of the developer and signal the passage of a preset time appropriate to the developing time required.

(B) Each automatic processor and any other closed processing system shall meet all of the following requirements:

(i) All film shall be developed in accordance with the time-temperature relationships recommended by the film manufacturer. In the absence of these recommendations, the film shall be developed using the following chart:

<table>
<thead>
<tr>
<th>Thermometer Reading (Degrees)</th>
<th>Minimum Developing Time (Minutes)</th>
<th>°C</th>
<th>°F</th>
</tr>
</thead>
<tbody>
<tr>
<td>18.9</td>
<td>5 ½</td>
<td>66</td>
<td>96</td>
</tr>
<tr>
<td>18.3</td>
<td></td>
<td>65</td>
<td>95</td>
</tr>
<tr>
<td>17.8</td>
<td></td>
<td>64</td>
<td>94</td>
</tr>
<tr>
<td>17.2</td>
<td>7</td>
<td>63</td>
<td>93</td>
</tr>
<tr>
<td>16.7</td>
<td>8</td>
<td>62</td>
<td>92</td>
</tr>
<tr>
<td>16.1</td>
<td></td>
<td>61</td>
<td>91</td>
</tr>
<tr>
<td>15.6</td>
<td></td>
<td>60</td>
<td>90</td>
</tr>
</tbody>
</table>

(B) Each automatic processor and any other closed processing system shall meet all of the following requirements:

(ii) The specified developer temperature and immersion time shall be posted in the darkroom or on the automatic processor.

(iii) Devices shall be utilized that indicate the actual temperature of the developer and signal the passage of a preset time appropriate to the developing time required.

(B) Each automatic processor and any other closed processing system shall meet all of the following requirements:

(i) All film shall be developed in accordance with the time-temperature relationships recommended by the film manufacturer. In the absence of these recommendations, the film shall be developed using the following chart:

<table>
<thead>
<tr>
<th>Developer Temperature</th>
<th>Minimum Immersion Timea</th>
</tr>
</thead>
<tbody>
<tr>
<td>°C</td>
<td>°F</td>
</tr>
<tr>
<td>35.5</td>
<td>96</td>
</tr>
<tr>
<td>35</td>
<td>95</td>
</tr>
<tr>
<td>34.5</td>
<td>94</td>
</tr>
<tr>
<td>34</td>
<td>93</td>
</tr>
<tr>
<td>33.5</td>
<td>92</td>
</tr>
<tr>
<td>33</td>
<td>91</td>
</tr>
<tr>
<td>32</td>
<td>90</td>
</tr>
<tr>
<td>31.5</td>
<td>89</td>
</tr>
<tr>
<td>31</td>
<td>88</td>
</tr>
<tr>
<td>30.5</td>
<td>87</td>
</tr>
<tr>
<td>30</td>
<td>86</td>
</tr>
<tr>
<td>29.5</td>
<td>85</td>
</tr>
</tbody>
</table>

aReflects immersion time only, with no crossover time included.

(ii) The specified developer temperature and immersion time shall be posted in the darkroom or on the automatic processor.
(C) Each deviation from any requirements specified in paragraph (e)(1) shall be documented by the registrant in such a manner that the requirements are shown to be met or exceeded.

(2) In addition to the requirements specified in paragraph (e)(1), all of the following requirements shall be met:

(A) Pass boxes, if provided, shall be constructed to exclude light from the darkroom when cassettes are placed in or removed from the boxes and shall incorporate shielding from stray radiation to prevent any exposure of undeveloped film.

(B) The darkroom shall be lighttight and shall use safe lighting so that any film type exposed in a cassette to X-radiation sufficient to produce an optical density measuring from one to two when processed does not exhibit an increase in density greater than 0.1 when exposed in the darkroom for two minutes with all safe lights on. If daylight film-handling boxes are used, these boxes shall prevent any fogging of the film.

(C) Each darkroom typically used by more than one individual shall be equipped with a method to prevent accidental entry while undeveloped film is handled or processed.

(D) All film shall be stored in a cool, dry place and shall be protected from exposure to stray radiation. Film in open packages shall be stored in a lighttight container.

(E) All film cassettes and intensifying screens shall be inspected periodically and shall be cleaned or replaced as necessary to ensure radiographs of good diagnostic quality.

(F) Outdated X-ray film shall not be used for diagnostic radiographs, unless the film has been stored in accordance with the manufacturer's recommendations and a sample of the film passes a sensitometric test for the normal range of the base optical density plus fogging for the film speed.

(G) All film-developing solutions shall be maintained in strength by replenishment or renewal so that full development is accomplished within the time frame specified by the manufacturer.

(Authorized by and implementing K.S.A. 48-1607; effective Dec. 30, 2005.)

28-35-242b. General requirements for all diagnostic X-ray systems. In addition to meeting the other requirements of this
part, each diagnostic X-ray system shall meet the following requirements:

(a) Warning label. The control panel containing the main power switch shall bear this or an equivalent warning statement, which shall be legible and accessible to view: "WARNING: This X-ray unit could be dangerous to patient and operator unless safe exposure factors and operating instructions are observed."

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

c) Leakage radiation from the diagnostic source assembly. The leakage radiation from the diagnostic source assembly measured at a distance of one meter in any direction from the source shall not exceed 25.8 uC/kg (100 milliroentgens) in one hour when the X-ray tube is operated at the leakage technique factors specified by the manufacturer. Compliance shall be determined by measuring the leakage radiation averaged over an area of 100 square centimeters, with no linear dimension greater than 20 centimeters.

d) Radiation from components other than the diagnostic source assembly. The radiation emitted by a component other than the diagnostic source assembly shall not exceed 0.5 uC/kg (2 milliroentgens) in one hour at five centimeters from an accessible surface of the component in an assembled X-ray system operated under any design conditions. Compliance shall be determined by measuring the radiation averaged over an area of 100 square centimeters, with no linear dimension greater than 20 centimeters.

e) Beam quality.

1) Half-value layer.

(A) The half-value layer of a given X-ray tube potential shall not be less than the values shown in table I in this paragraph. Linear interpolation and extrapolation may be used if necessary to determine the half-value layer at an X-ray tube potential that is not listed in table I.

<table>
<thead>
<tr>
<th>Operating range (kilovolts peak)</th>
<th>Measured potential (kilovolts peak)</th>
<th>Half-value layer (millimeters of aluminum)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 50</td>
<td>30</td>
<td>0.3</td>
</tr>
<tr>
<td></td>
<td>40</td>
<td>0.4</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Operating range (kilovolts peak)</th>
<th>Measured potential (kilovolts peak)</th>
<th>Half-value layer of aluminum (millimeters)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 through 70</td>
<td>50</td>
<td>1.2</td>
</tr>
<tr>
<td>60</td>
<td>1.3</td>
<td></td>
</tr>
<tr>
<td>70</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>Above 70</td>
<td>71</td>
<td>2.1</td>
</tr>
<tr>
<td>80</td>
<td>2.3</td>
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(B) For capacitor energy storage equipment, compliance shall be determined with the system fully charged and set at 10 mAs for each exposure.

(C) The required minimal half-value layer of the useful beam shall include the filtration contributed by all materials that are permanently located between the source and the patient.

(2) Filtration controls. For each X-ray system that has variable kVp and variable filtration for the useful beam, a device shall link the kVp selector with the filter or filters and shall prevent an exposure, unless the minimum amount of filtration necessary to produce the required HVL is in the useful beam for the given kVp that has been selected.

(f) Multiple tubes. If two or more radiographic tubes are controlled by one exposure switch, each tube that has been selected shall be clearly indicated before 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) Mechanical support of the tube head. The tube housing assembly supports shall be adjusted so that the tube housing assembly remains stable during each exposure, unless tube housing movement is a designed function of the X-ray system.

(h) Technique indicators.
(1) The technique factors to be used during each exposure shall be indicated before the exposure begins. If automatic exposure controls are used, the technique factors that are set before the exposure shall be indicated.

(2) The requirements of paragraph (h)(1) may be met by permanent marking on equipment that has fixed technique factors. The indication of technique factors shall be visible from the operator's position, except in the case of spot films made by the fluoroscopist.

(i) Maintaining compliance. All diagnostic X-ray systems and their associated components used on humans and certified pursuant to the federal X-ray equipment performance standard in 21 CFR part 1020 shall be maintained in compliance with the applicable requirements of that standard.

(j) Locks. All position-locking, holding, and centering devices that are on X-ray system components and systems shall function as intended and shall be maintained according to each manufacturer's recommendations. (Authorized by and implementing K.S.A. 48-1607; effective Dec. 30, 2005.)


28-35-243a. Fluoroscopic X-ray systems. Each fluoroscopic X-ray system used shall be image-intensified and shall meet the following requirements:

(a) Limitation of useful beam.

(1) Primary barrier.

(A) 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.

(B) The X-ray tube used for fluoroscopy shall not produce X-rays unless the barrier is in position to intercept the entire useful beam.

(2) Fluoroscopic beam limitation.

(A) For certified fluoroscopic systems with or without a spot film device, 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 three percent of the SID. The sum
of the excess length and the excess width shall be no greater than four percent of the SID.

(B) For uncertified fluoroscopic systems with a spot film device, the X-ray beam with the shutters fully opened during fluoroscopy or spot filming shall be no larger than the largest spot-film size for which the device is designed. Measurements shall be made at the minimum SID available but at a distance of not less than 20 centimeters from the tabletop to the film plane.

(C) For uncertified fluoroscopic systems without a spot film device, the requirements of this regulation shall apply.

(D) Other requirements for fluoroscopic beam limitation shall include the following:

(i) A means shall be provided to permit further limitation of the field. Beam-limiting devices manufactured after May 22, 1979 and incorporated in equipment with a variable SID or a visible area of greater than 300 square centimeters, or both, shall be provided with a means for stepless adjustment of the X-ray field.

(ii) All equipment with a fixed SID and a visible area of 300 square centimeters or less shall be provided either with stepless adjustment of the X-ray field or with a means to further limit the X-ray field size, at the plane of the image receptor, to 125 square centimeters or less.

(iii) If provided, stepless adjustment shall, at the greatest SID, provide continuous field sizes from the maximum attainable to a field size of five centimeters by five centimeters or less.

(iv) For equipment manufactured after February 25, 1978, if the angle between the image receptor and beam axis is variable, a means shall be provided to indicate when the axis of the X-ray beam is perpendicular to the plane of the image receptor.

(v) For noncircular 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.

(3) Spot-film beam limitation. Each spot-film device shall meet the following requirements:

(A) A means shall be provided between the source and the patient 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. This 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. For spot-film devices manufactured after June 21, 1979, if the X-ray field size is less than the size of the selected portion of the film, the means for adjustment of the field size shall be only at the operator's option.

(B) Neither the length nor the width of the X-ray field in the plane of the image receptor shall differ from the corresponding dimensions of the selected portion of the image receptor by more than three percent of the SID when adjusted for full coverage of the selected portion of the image receptor. The sum of the length and width differences, without regard to sign, shall not exceed four percent of the SID.

(C) It shall be possible to adjust the X-ray field size in the plane of the film to a size smaller than the selected portion of the film. The minimum field size at the greatest SID shall be equal to or less than five centimeters by five centimeters.

(D) 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 two percent of the SID.

(E) For spot-film devices manufactured after February 25, 1978, if the angle between the plane of the image receptor and beam axis is variable, a means shall be provided to indicate when the axis of the X-ray beam is perpendicular to the plane of the image receptor, and compliance shall be determined with the beam axis indicated to be perpendicular to the plane of the image receptor.

(4) Override. Each method used to override any of the automatic X-ray field size adjustments required in paragraphs (a)(2) and (3) shall meet the following requirements:

(A) Be designed for use only if system failure occurs;

(B) incorporate a signal visible at the fluoroscopist's position that indicates whenever the automatic field size adjustment is overridden; and

(C) be clearly and durably labeled with the following, or equivalent wording:

**FOR X-RAY FIELD LIMITATION SYSTEM FAILURE**

(b) Activation of the fluoroscopic tube. All X-ray production in the fluoroscopic mode shall be controlled by a device that requires continuous manual activation by the fluoroscopist during the entire time of any exposure. When recording serial fluoroscopic images,
the fluoroscopist shall be able to terminate the X-ray exposure or exposures at any time, but a means may be provided to permit completion of any single exposure of the series in process.

(c) Exposure rate limits.
   (1) Allowable limits for the entrance exposure rate.
      (A) Fluoroscopic equipment that is provided with an automatic exposure rate control shall not be operable at any combination of tube potential and current that will result in an exposure rate in excess of 2.6 mC/kg (10 roentgens) per minute at the point where the center of the useful beam enters the patient, except under either of the following conditions:
         (i) When fluoroscopic images are being recorded; or
         (ii) when an optional high-level control is provided. When provided, the X-ray system shall not be operable at any combination of tube potential and current that will result in an exposure rate in excess of 1.3 mC/kg (5 roentgens) per minute at the point where the center of the useful beam enters the patient, unless the high-level control is activated. A special means of activation of high-level controls shall be required. The high-level control shall be operable only when continuous manual activation is provided by the operator. A continuous signal audible to the fluoroscopist shall indicate that the high-level control is being employed.
      (B) Fluoroscopic equipment that is not provided with an automatic exposure rate control shall not be operable at any combination of tube potential and current that will result in an exposure rate in excess of 1.3 mC/kg (5 roentgens) per minute at the point where the center of the useful beam enters the patient, except during either of the following:
         (i) When fluoroscopic images are being recorded; or
         (ii) when an optional high-level control is activated. A special means of activation of the high-level control shall be required. The high-level control shall be operable only when continuous manual activation is provided by the operator. A continuous signal audible to the fluoroscopist shall indicate that the high-level control is being employed.
      (C) Fluoroscopic equipment that is provided with both an automatic exposure rate control mode and a manual mode shall not be operable at any combination of tube potential and current that will result in an exposure rate in excess of 2.6 mC/kg (10 roentgens)
per minute in either mode at the point where the center of the useful beam enters the patient, except under either of the following conditions:

(i) When fluoroscopic images are being recorded; or
(ii) when the mode or modes have an optional high-level control. The mode or modes shall not be operable at any combination of tube potential and current that will result in an exposure rate in excess of 1.3 mC/kg (5 roentgens) per minute at the point where the center of the useful beam enters the patient, unless the high-level control is activated. A special means of activating of the high-level control shall be required. The high-level control shall be operable only when continuous manual activation is provided by the operator. A continuous signal audible to the fluoroscopist shall indicate that the high-level control is being employed.

(D) Fluoroscopic equipment manufactured after May 19, 1995 that can exceed 1.3 mC/kg (5 roentgens) per minute shall be equipped with an automatic exposure rate control. All entrance exposure rate limits shall be 2.6 mC/kg (10 roentgens) per minute with an upper limit of 5.2 mC/kg (20 roentgens) per minute when the high-level control is activated.

(E) Compliance with the requirements of this subsection shall be determined as follows:

(i) If the source is below the X-ray table, the exposure rate shall be measured at one centimeter above the tabletop or cradle.

(ii) If the source is above the X-ray table, the exposure rate shall be measured at 30 centimeters above the tabletop with the end of the beam-limiting device or spacer positioned as closely as possible to the point of measurement.

(iii) For any fluoroscopy system capable of changing the X-ray beam orientation, which is also known as a C-arm system, the exposure rate shall be measured at 30 centimeters from the input surface of the fluoroscopic imaging assembly. The source may be positioned at any available SID, if the end of the beam-limiting device or spacer is no closer than 30 centimeters from the input surface of the fluoroscopic imaging assembly.

(iv) For a lateral-type fluoroscope, the exposure rate shall be measured at a point that is 15 centimeters from the centerline of the X-ray table and in the direction of the X-ray source, with the end of the beam-limiting device or spacer positioned as closely as possible to the point of measurement. A moveable tabletop shall be
positioned as closely as possible to the lateral X-ray source, with the end of the beam-limiting device or spacer no closer than 15 centimeters to the centerline of the X-ray table.

(2) Periodic measurements of the entrance exposure rate shall be taken by a qualified expert for both the typical and the maximum values according to all of the following requirements:

(A) The measurements shall be taken annually and after any maintenance of the system that might affect the exposure rate.

(B) The results of these measurements shall be posted at a location where any fluoroscopist has ready access to the results while using the fluoroscope and in the record required by this regulation. The measurement results shall be stated in coulombs per kilogram (roentgens) per minute and shall include the technique factors used in determining the results. The name of the individual performing the measurements and the date on which the measurements were performed shall be included in the results.

(C) The conditions under which periodic measurements of the entrance exposure rate are taken shall meet the following requirements:

(i) Each measurement shall be made under the conditions that meet the requirements of this regulation.

(ii) The kVp, mA, and other selectable parameters shall be adjusted to those settings typical in clinical use for a patient with an abdomen that is 23 cm thick.

(iii) Each X-ray system that incorporates any automatic exposure rate controls shall have sufficient attenuative material placed in the useful beam to produce milliamperage and kilovoltage that meet the requirements of this regulation.

(D) The conditions under which periodic measurements of the maximum entrance exposure are taken shall meet the following requirements:

(i) The measurement shall be made under the conditions that meet the requirements of this regulation.

(ii) The kVp, mA, and other selectable parameters shall be adjusted to those settings that produce the maximum entrance exposure rate.

(iii) Each X-ray system that incorporates automatic exposure rate controls shall have sufficient attenuative material placed in the
useful beam to produce the maximum entrance exposure rate of the system.

(d) Barrier-transmitted radiation rate limits.
   (1) The exposure rate due to transmission through the primary protective barrier with the attenuation block in the useful beam, combined with radiation from the image intensifier, if provided, shall not exceed 0.5 uC/kg (2 milliroentgens) per hour at 10 centimeters from any accessible surface of the fluoroscopic imaging assembly beyond the plane of the image receptor for each mC/kg (4 roentgens) per minute of entrance exposure rate.
   (2) Measuring compliance of barrier transmission.
      (A) The exposure rate due to transmission through the primary protective barrier combined with radiation from the image intensifier shall be determined by measuring the radiation averaged over an area of 100 square centimeters, with no linear dimension greater than 20 centimeters.
      (B) If the source is below the tabletop, the measurement shall be taken with the input surface of the fluoroscopic imaging assembly positioned at 30 centimeters above the tabletop.
      (C) If the source is above the tabletop and the SID is variable, the measurement shall be taken with the end of the beam-limiting device or spacer placed as close to the tabletop as possible, but not closer than 30 centimeters.
      (D) All movable grids and compression devices shall be removed from the useful beam during the measurement.
   (e) Indication of potential and current. During fluoroscopy and cinefluorography, the kV and the mA shall be continuously indicated.
   (f) Source-to-skin distance (SSD). Unless otherwise approved by the food and drug administration, the SSD shall not be less than the following:
      (1) 38 centimeters on stationary fluoroscopic systems manufactured on or after August 1, 1974;
      (2) 35.5 centimeters on stationary fluoroscopic systems manufactured before August 1, 1974;
      (3) 30 centimeters on all mobile fluoroscopes; and
      (4) 20 centimeters for all mobile fluoroscopes when used for specific surgical applications.
   (g) Fluoroscopic timer.
(1) A method shall be provided to preset the cumulative amount of time during which the fluoroscopic X-ray tube is on. The maximum cumulative amount of time during which the fluoroscopic X-ray tube is on shall not exceed five minutes without resetting the timing device.

(2) A signal audible to the fluoroscopist shall indicate the completion of any preset cumulative time. The signal shall continue to sound while X-rays are produced until the timing device is reset.

(h) Control of scattered radiation.

(1) Each fluoroscopic table, when combined with the medical procedures performed, shall be such that no unprotected part of the body of any staff member or ancillary individual shall be exposed to unattenuated scattered radiation that originates from under the table. The attenuation required shall be not less than 0.25 millimeter lead-equivalent.

(2) The equipment configuration and operating procedures used shall prevent any portion of the body of any staff member or ancillary individual, except the extremities, from being exposed to the unattenuated scattered radiation emanating from above the tabletop, unless either of the following conditions is met:

(A) The individual is at least 120 centimeters from the center of the useful beam.

(B) The radiation has passed through not less than 0.25 millimeter of lead-equivalent material including drapes, a bucky-slot cover panel, and self-supporting curtains, in addition to any lead equivalency provided by any protective apron.

(3) Exemptions to paragraph (h)(2) may be granted by the secretary if a sterile field does not permit the use of the normal protective barriers. If the use of prefitted sterilized covers for the barriers is practical, an exemption shall not be granted. Exceptions shall be automatically granted for the following fluoroscopic procedures only if a sterile field does not permit the use of the normal protective barriers:

(A) Angiograms;

(B) arthograms;

(C) biliary drainage procedures;

(D) fluoroscopic biopsy procedures;

(E) myelograms;

(F) percutaneous cholangiograms;
(G) percutaneous nephrostomies;
(H) sinograms or fistulograms; and
(I) T-tube cholangiograms.

(i) Spot-film exposure reproducibility. Each fluoroscopic system equipped with a spot-film mode shall meet the exposure reproducibility requirements of K.A.R. 28-35-244a [p.268] when operating in the spot-film mode.

(j) Radiation therapy simulation systems. Each radiation therapy simulation system shall be exempt from the requirements of subsection (c) of this regulation. In addition, this type of system shall be exempt from the following:

1. The requirements of subsections (a) and (d) of this regulation, if the system is designed and used so that no individual other than the patient is in the X-ray room when the system is producing X-rays; and

2. The requirements of subsection (g) of this regulation, if the system is provided with a means of indicating the cumulative time that an individual patient has been exposed to X-rays. Procedures shall be established to require that the cumulative time be reset between examinations. (Authorized by and implementing K.S.A. 48-1607; effective Dec. 30, 2005.)

28-35-244a. Radiographic systems other than fluoroscopic, dental intraoral, or computed tomography X-ray systems. (a) Beam limitation, except for mammographic systems. Each registrant shall ensure that the useful beam is collimated to the area of clinical interest. This requirement shall be deemed to have been met if a positive beam-limiting device meeting the manufacturer's specifications and the requirements of this regulation has been used or if evidence of collimation is shown on at least three sides or three corners of the film, including projections from the shutters of the collimator, cone cutting at the corners, and borders at the film's edge.

1. General-purpose stationary and mobile X-ray systems including veterinary systems, other than portable systems, installed after the effective date of these regulations.
(A) Each registrant shall use only X-ray systems provided with the means for independent stepless adjustment of at least two dimensions of the X-ray field.

(B) Each registrant shall ensure that a method is provided for visually defining the perimeter of the X-ray field. The total misalignment of the edges of the visually defined field with the respective edges of the X-ray field along either the length or width of the visually defined field shall not exceed two percent of the distance from the source to the center of the visually defined field when the surface upon which the visually defined field appears is perpendicular to the axis of the X-ray beam.

(C) An exemption from paragraphs (a)(1)(A) and (B) may be granted by the secretary for noncertified X-ray systems if the registrant submits a written application for the exemption and that application meets the following conditions:

(i) Demonstrates that it is impractical to comply with paragraphs (a)(1)(A) and (B); and

(ii) demonstrates that the purpose of paragraphs (a)(1)(A) and (B) will be met by other methods.

(2) Additional requirements for stationary general purpose X-ray systems. In addition to the requirements of paragraph (a)(1), each registrant shall ensure that all stationary general-purpose X-ray systems, both certified and noncertified, meet all of the following requirements:

(A) A method shall be provided to indicate when the axis of the X-ray beam is perpendicular to the plane of the image receptor, to align the center of the X-ray field with respect to the center of the image receptor to within two percent of the SID, and to indicate the SID to within two percent.

(B) The beam-limiting device shall indicate numerically the field size in the plane of the image receptor to which the device is adjusted.

(C) The indication of the field size dimensions and SID shall be specified in inches or centimeters, or both, and shall be such that aperture adjustments result in X-ray field dimensions in the plane of the image receptor that correspond to X-ray field dimensions indicated by the beam-limiting device to within two percent of the SID when the beam axis is indicated to be perpendicular to the plane of the image receptor.
(3) X-ray systems designed for one size of image receptor. Radiographic equipment designed for only one size of image receptor at a fixed SID shall be provided with the means to limit the field at the plane of the image receptor to dimensions no greater than those of the image receptor and to align the center of the X-ray field with the center of the image receptor to within two percent of the SID, or shall be provided with the means to both adjust the size of and align the X-ray field so that the X-ray field at the plane of the image receptor does not extend beyond any edge of the image receptor.

(4) X-ray systems other than those described in this subsection and veterinary systems installed before the effective date of this regulation and all portable veterinary X-ray systems.

(A) A means shall be provided to limit the X-ray field in the plane of the image receptor so that the field does not exceed each dimension of the image receptor by more than two percent of the SID when the axis of the X-ray beam is perpendicular to the plane of the image receptor.

(B) A means shall be provided to align the center of the X-ray field with the center of the image receptor to within two percent of the SID, or the means shall be provided to both adjust the size of and align the X-ray field so that the X-ray field at the plane of the image receptor does not extend beyond any edge of the image receptor. Compliance shall be determined with the axis of the X-ray beam perpendicular to the plane of the image receptor.

(C) The requirements of paragraphs (a)(4)(A) and (B) may be met with a system that meets the requirements for a general-purpose X-ray system as specified in paragraph (a)(1) or, when alignment means are also provided, may be met with either of the following:

(i) An assortment of removable, fixed-aperture, beam-limiting devices sufficient to meet the requirements for each combination of image receptor size and SID for which the system is designed, with each such device having clear and permanent markings to indicate the image receptor size and SID for which the system is designed; or

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

(b) Radiation exposure control.

(1) Exposure initiation. A means shall be provided to initiate the radiation exposure by a deliberate action on the part of the operator, including the depression of a switch. Radiation exposure shall not be initiated without such an action. In addition, it shall not be possible to initiate an exposure when the timer is set to a "zero" or "off" position if either position is provided.

(2) Exposure indication. A means shall be provided for visual indication observable at or from the operator's protected position whenever X-rays are produced. In addition, a signal audible to the operator shall indicate that the exposure has terminated.

(3) Exposure termination. A means shall be provided to terminate the exposure at a preset time interval, preset product of current and time, a present number of pulses, or a preset radiation exposure to the image receptor. Except for dental panoramic systems, termination of each exposure shall cause the automatic resetting of the timer to its initial setting or to "zero."

(A) Manual exposure control. An X-ray control shall be incorporated into each X-ray system so that each exposure can be terminated by the operator at any time, except for either of the following:

(i) During any exposure of one-half second or less; or

(ii) during serial radiography, when a means shall be provided to permit the completion of any single exposure of the series in process.

(B) Automatic exposure controls. When an automatic exposure control is provided, all of the following requirements shall be met:

(i) The mode of operation selected shall be indicated on the control panel.

(ii) If the X-ray tube potential is equal to or greater than 50kVp, the minimum exposure time for field emission equipment rated for pulsed operation shall be equal to or less than a time interval equivalent to two pulses.

(iii) The minimum exposure time for all equipment other than that specified in paragraph (b)(2)(B) shall be equal to or less
than one-sixtieth of a second or the time interval required to deliver 5 mAs, whichever is greater.

(iv) Either the product of the peak X-ray tube potential, current, and exposure time shall be limited to not more than 60 kWs per exposure, or the product of the X-ray tube current and exposure time shall be limited to not more than 600 mAs per exposure. However, when the X-ray tube potential is less than 50 kVp, the product of the X-ray tube current and exposure time shall be limited to not more than 2,000 mAs per exposure.

(v) A visible signal shall indicate when an exposure has been terminated at the limits required by paragraph (b)(2)(D), and manual resetting shall be required before further automatically timed exposures can be made.

(4) Exposure duration or timer linearity. For systems that provide for the independent selection of exposure time settings, the average ratios \(X_1\) of exposure to the indicated timer setting, in units of \(C \text{ kg}^{-1}\text{s}^{-1} \text{ (mR/s)}\), obtained at any two clinically used timer settings shall not differ by more than 0.10 times their sum. This calculation is written as follows:

\[
(X_1 - X_2) \leq 0.1 \frac{(X_1 + X_2)}{2}
\]

where \(X_1\) and \(X_2\) are the average \(C \text{ kg}^{-1}\text{s}^{-1} \text{ (mR/s)}\) values.

(5) Exposure control location. The X-ray exposure control shall be placed so that the operator can view the patient while making any exposure.

(6) Operator protection, except for veterinary systems.

(A) Stationary systems. Each stationary X-ray system shall be required to have the X-ray control permanently mounted in a protected area so that the operator is required to remain in that protected area during the entire exposure.

(B) Mobile and portable systems. Each mobile and each portable X-ray system shall meet the following requirements:

(i) If used for one week or more at the same location, including a room or a suite, meet the requirements of paragraph (b)(6)(A); or

(ii) if used for less than one week at the same location, be provided with either a protective barrier that is at least two meters or 6.5 feet high for operator protection during exposures or a means to allow the operator to be at least 2.7 meters or 9 feet from the tube housing assembly during the exposure.
(7) Operator protection for veterinary systems. All stationary, mobile, or portable X-ray systems used for veterinary work shall be provided with either a protective barrier that is at least two meters or 6.5 feet high for operator protection during exposures or a means to allow the operator to be at least 2.7 meters or nine feet from the tube housing assembly during exposures.

(c) Source-to-skin distance. Each mobile or portable radiographic system shall be provided with the means to limit the source-to-skin distance to equal to or greater than 30 centimeters, except for veterinary systems or systems specifically approved by the FDA.

(d) Exposure reproducibility. When all technique factors are held constant, including control panel selections associated with automatic exposure control systems, the coefficient of variation of exposure for both manual and automatic exposure control systems shall not exceed 0.05. This requirement shall apply to all clinically used techniques.

(e) Radiation from capacitor energy storage equipment in standby status. The radiation emitted from the X-ray tube when the system is fully charged and the exposure switch or timer is not activated shall not exceed a rate of 0.5 uC/kg (2 milliroentgens) per hour at five centimeters from any accessible surface of the diagnostic source assembly, with the beam-limiting device fully open.

(f) Accuracy. Deviation of the measured technique factors from the indicated values of kVp and exposure time shall not exceed the limits specified for each system by its manufacturer. In the absence of manufacturer's specifications, the deviation shall not exceed 10 percent of the indicated value for kVp and 20 percent for exposure time.

(g) mA and mAs linearity. The following requirements shall apply when the equipment is operated with a power supply as specified by the manufacturer for any fixed X-ray tube potential within the range of 40 percent to 100 percent of the maximum rated mA or mAs.

(1) Equipment that provides for the independent selection of X-ray tube current (mA). The average ratios (X-1) of exposure to the indicated milliampere-seconds product C kg\(^{-1}\) mAs\(^{-1}\) (or mR/mAs) obtained at any two consecutive tube current settings shall not differ
by more than 0.10 times their sum. This calculation is written as follows:

\[(X_1 - X_2) \leq 0.10 (X_1 + X_2)\]

where \(X_1\) and \(X_2\) are the average values obtained at each of two consecutive tube current settings, or at two settings differing by no more than a factor of two when the tube current selection is continuous.

(2) Equipment that has a combined X-ray tube current-exposure time product (mAs) selector, but not a separate tube current (mA) selector. The average ratios \((X_i)\) of exposure to the indicated milliampere-seconds product, in units of \(\text{C kg}^{-1}\ \text{mAs}^{-1}\) (or \(\text{mR/mAs}\)), obtained at any two consecutive mAs selector settings shall not differ by more than 0.10 times their sum. This calculation is written as follows:

\[(X_1 - X_2) \leq 0.10 (X_1 + X_2)\]

where \(X_1\) and \(X_2\) are the average values obtained at each of two mAs selector settings, or at two settings differing by no more than a factor of two when the mAs selector provides continuous selection.

(3) Measuring compliance. Determination of compliance shall be based on 10 exposures taken within one hour, at each of the two settings specified by this subsection. These two settings may include any two focal spot sizes, unless one is equal to or less than 0.45 millimeters and the other is greater than 0.45 millimeters. For purposes of this requirement, focal spot size shall mean the nominal focal spot size specified by the X-ray tube manufacturer.

(h) Additional requirements applicable to certified systems only. Diagnostic X-ray systems incorporating one or more certified components shall be required to meet the following additional requirements that relate to that certified component or components.

(1) Beam limitation for stationary and mobile general-purpose X-ray systems.

(A) A means of stepless adjustment of the size of the X-ray field shall be provided. The minimum field size at an SID of 100 centimeters shall be equal to or less than five centimeters by five centimeters.
(B) If a light localizer is used to define the X-ray field, the localizer shall provide an average illumination of not less than 160 lux or 15 foot-candles at 100 centimeters or at the maximum SID, whichever is less. The average illumination shall be based on measurements made in the approximate center of each quadrant of the light field. Radiation therapy simulation systems manufactured on and after May 27, 1980 shall be exempt from this requirement.

(C) The edge of the light field at 100 centimeters or at the maximum SID, whichever is less, shall have a contrast ratio, when corrected for ambient lighting, of not less than four for beam-limiting devices designed for use on stationary equipment and a contrast ratio of not less than three for beam-limiting devices designed for use on mobile equipment. The contrast ratio shall be defined as $I_1/I_2$ where $I_1$ is the illumination at three millimeters from the edge of the light field toward the center of the field, and $I_2$ is the illumination at three millimeters from the edge of the light field away from the center of the field. Compliance shall be determined by using a measuring instrument that has an aperture of one millimeter in diameter.

(2) Beam limitation and alignment on stationary general-purpose X-ray systems equipped with positive beam limitation (PBL). If PBL is being used, all of the following requirements shall be met:

(A) The PBL shall prevent the production of X-rays when either of the following occurs:

(i) The length or width of the X-ray field in the plane of the image receptor differs, except as permitted by paragraph (h)(2)(C), from the corresponding image receptor dimensions by more than three percent of the SID.

(ii) The sum of the length and width differences as stated in paragraph (h)(2)(A)(i), without regard to sign, exceeds four percent of the SID.

(B) Compliance with paragraph (h)(2)(A) shall be determined when the equipment indicates that the beam axis is perpendicular to the plane of the image receptor. Compliance shall be determined no sooner than five seconds after insertion of the image receptor.

(C) The PBL system shall be capable of operation, at the discretion of the operator, so that the size of the field can be made
smaller than the size of the image receptor through stepless adjustment of the field size. The minimum field size at an SID of 100 centimeters shall be equal to or less than five centimeters by five centimeters.

(D) The PBL system shall be designed so that if a change in image receptor does not cause an automatic return to PBL function as described in paragraph (h)(2)(A), then any change of image receptor size or SID shall cause the automatic return to PBL function.

(3) Beam limitation for portable X-ray systems. Beam limitation for each portable X-ray system shall meet the beam limitation requirements in paragraph (a)(1) or (h)(2).

(i) Tube stands for portable X-ray systems. A tube stand or other mechanical support shall be used for portable X-ray systems, so that the X-ray tube housing assembly does not need to be handheld during exposures. (Authorized by and implementing K.S.A. 48-1607; effective Dec. 30, 2005.)
(a) Source-to-skin distance (SSD). X-ray systems designed for use with an intraoral image receptor shall be provided with a means to limit the SSD to not less than either of the following:

1. 18 centimeters if operable above 50 kVp; or
2. 10 centimeters if operable at 50 kVp only.

(b) kVp limitations. Dental X-ray machines with a nominal fixed kVp of less than 50 kVp shall not be used to make diagnostic dental radiographs of humans.

(c) Beam limitation. Each radiographic system designed for use with an intraoral image receptor shall be provided with a means to limit the X-ray beam so that the beam at the minimum SSD is containable in a circle with a diameter of no more than seven centimeters.

(d) Radiation exposure control.

1. Exposure initiation.
   (A) A means shall be provided to initiate the radiation exposure by a deliberate action on the part of the operator, including the depression of a switch. Radiation exposure shall not be initiated without such an action.
   (B) When the timer is set to a "zero" or "off" position, if either position is provided, an exposure shall not be possible.

2. Exposure indication. A means shall be provided for a visual indication observable at or from the operator's protected position whenever X-rays are produced. In addition, a signal audible to the operator shall indicate that the exposure has terminated.

3. Exposure termination.
   (A) A means shall be provided to terminate each 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.
   (B) An X-ray exposure control shall be incorporated into each X-ray system so that each exposure can be terminated by the operator at any time, except for exposures of one-half second or less.
   (C) Each termination of an exposure shall cause the automatic resetting of the timer to its initial setting or to "zero."

4. Exposure duration or timer linearity. For each system that provides for the independent selection of exposure time settings, the average ratios \( X_1 \) of exposure to the indicated timer setting, in units of \( \text{C kg}^{-1} \text{s}^{-1} \) (mR/s), obtained at any two clinically
used time settings shall not differ by more than 0.10 times their sum. The linearity is calculated using the following equation:

\[ (X_1 - X_2) \leq 0.10 (X_1 + X_2) \]

where \( X_1 \) and \( X_2 \) are the average ratios of exposure to the indicated timer setting.

(5) Exposure control location and operator protection.
(A) Each stationary X-ray system shall be required to have the X-ray exposure control permanently mounted in a protected area so that the operator is required to remain in that protected area during the entire exposure.
(B) Each mobile or portable X-ray system used for one week or longer in the same location, including a room or suite, shall meet the requirements of this regulation.
(C) Each mobile or portable X-ray system used for less than one week in the same location shall be provided either with a protective barrier that is at least two meters (6.5 feet) high for operator protection or with the means to allow the operator to be at least 2.7 meters (9 feet) from the tube housing assembly while making exposures.
(e) Reproducibility. When the equipment is operated with an adequate power supply as specified by the manufacturer, the estimated coefficient of variation of radiation exposures shall be no greater than 0.05 for any specific combination of selected technique factors.
(f) mA and mAs linearity. The requirements specified in this subsection shall apply when the equipment is operated with a power supply as specified by the manufacturer for any fixed X-ray tube potential within the range of 40 percent to 100 percent of the maximum rated mA or mAs.
(1) Equipment that provides for the independent selection of X-ray tube current (mA). The average ratios \( X_1 \) of exposure to the indicated milliampere-seconds product, in units of \( \text{C kg}^{-1} \text{mAs}^{-1} \) (or \( \text{mR/mAs} \)), obtained at any two consecutive tube current settings shall not differ by more than 0.10 times their sum. The linearity is calculated using the following equation:
(2) Equipment that has a combined X-ray tube current-exposure time mAs selector but not a separate tube current (mA) selector. The average ratios \(X_1\) of exposure to the indicated milliampere-seconds product, in units of \(\text{C kg}^{-1} \text{mAs}^{-1}\) (or \(\text{mR/mAs}\)), obtained at any two consecutive mAs selector settings shall not differ by more than 0.10 times their sum. The linearity is calculated using the following equation:

\[
X_1 - X_2 \leq 0.10 (X_1 + X_2)
\]

where \(X_1\) and \(X_2\) are the average values obtained at any two mAs selector settings, or at two settings differing by no more than a factor of two if the mAs selector provides continuous selection.

(3) Measuring compliance. Determination of compliance shall be based on 10 exposures taken within one hour, at each of two settings. These two settings may include any two focal spot sizes, unless one is equal to or less than 0.45 millimeters and the other is greater than 0.45 millimeters. For purposes of this regulation, "focal spot size" shall mean the nominal focal spot size specified by the X-ray tube manufacturer.

(g) Accuracy. The deviation of technique factors from the indicated values for kVp and exposure time, if time is independently selectable, shall not exceed the limits specified for that system by its manufacturer. In the absence of manufacturer's specifications, the deviation shall not exceed 10 percent of the indicated value for kVp and 20 percent for time.

(h) Administrative controls.

(1) Patient-holding and film-holding devices shall be used when the techniques permit.

(2) The tube housing and the position indication device (PID) shall not be handheld during an exposure.
Each X-ray system shall be operated so that the useful beam at the patient's skin does not exceed the requirements of this regulation.

(4) Dental fluoroscopy without image intensification shall not be used. (Authorized by and implementing K.S.A. 48-1607; effective Dec. 30, 2005.)


28-35-248a. Computed tomography (CT) X-ray systems.
(a) Definitions. In addition to the definitions in part 1 of these regulations, the following definitions shall be applicable to this regulation:

(1) "Computed tomography dose index" and "CTDI" mean the integral from -7T to +7T of the dose profile along a line perpendicular to the tomographic plane divided by the product of the normal tomographic section thickness and the number of tomograms produced in a single scan, as follows:

$$\text{CTDI} = \frac{1}{nT} \int_{-7T}^{+7T} D(z) \, dz$$

where:

\[
\begin{align*}
  z & \quad \text{Position along a line perpendicular to the tomographic plane;} \\
  D(z) & \quad \text{dose at position } z; \\
  T & \quad \text{nominal tomographic section thickness;} \\
  n & \quad \text{number of tomograms produced in a single scan.}
\end{align*}
\]

This definition assumes that the dose profile is centered around z=0 and that, for a multiple tomogram system, the scan increment between adjacent scans is nT.

(2) "Contrast scale" and "CS" mean the change in the linear attenuation coefficient per CTN relative to water, as follows:
(3) "CT conditions of operation" means all selectable parameters governing the operation of a CT X-ray system including nominal tomographic section thickness, filtration, and technique factors.

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

(5) "CT number" and "CTN" mean the number used to represent the X-ray attenuation associated with each elemental area of the CT image, as follows:

$$\text{CTN} = \frac{k \left( \mu_x - \mu_w \right)}{\mu_w}$$

where:

- $k$ = A constant, which is normally 1,000 when the Hounsfield scale of CTN is used;
- $\mu_x$ = linear attenuation coefficient of the material of interest; and
- $\mu_w$ = linear attenuation coefficient of water.

(6) "Dose profile" means the dose as a function of position along a line.

(7) "Elemental area" means the smallest area within a tomogram for which the X-ray attenuation properties of a body are depicted.
(8) "Multiple tomogram system" means a computed tomography X-ray system that obtains X-ray transmission data simultaneously during a single scan to produce more than one tomogram.

(9) "Noise" means the standard deviation of the fluctuations in CTN expressed as a percentage of the attenuation coefficient of water. Noise is estimated using the following equation:

$$S_a = \frac{100 \times CS \times s}{\mu_w}$$

where:
- $CS$ = Linear attenuation coefficient of the material of interest;
- $\mu_w$ = linear attenuation coefficient of water; and
- $s$ = standard deviation of the CTN of picture elements in a specified area of the CT image.

(10) "Nominal tomographic section thickness" means the full width at half-maximum of the sensitivity profile taken at the center of the cross-sectional volume over which the X-ray transmission data are collected.

(11) "Picture element" means an elemental area of a tomogram.

(12) "Reference plane" means a plane that is displaced from and parallel to the tomographic plane.

(13) "Scan" means 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.

(14) "Scan increment" means the amount of relative displacement of the patient with respect to the CT X-ray system between successive scans measured along the direction of the displacement.

(15) "Scan sequence" means a preselected set of two or more scans performed consecutively under preselected CT conditions of operation.

(16) "Scan time" means the period of time between the beginning and the end of X-ray transmission data accumulation for a single scan.
(17) "Single tomogram system" means a CT X-ray system that obtains X-ray transmission data during a scan to produce a single tomogram.

(18) "Tomographic plane" means the geometric plane that is identified as corresponding to the output tomogram.

(19) "Tomographic section" means the volume of an object whose X-ray attenuation properties are imaged in a tomogram.

(b) Requirements for equipment.

(1) Termination of exposure.

(A) A 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 if equipment failure affecting data collection occurs. This termination shall occur within an interval that limits the total scan time to no more than 110 percent of its preset value through the use of either a backup timer or devices that monitor equipment function.

(B) A visible signal shall indicate when the X-ray exposure has been terminated as specified in paragraph (b)(1)(A).

(C) Each operator shall be able to terminate the X-ray exposure at any time during a scan, or series of scans under CT X-ray systems control, of greater duration than one-half second.

(2) Tomographic plane indication and alignment.

(A) For any single tomogram system, a means shall be provided to permit the visual determination of the tomographic plane or a reference plane offset from the tomographic plane.

(B) For any multiple tomogram system, a means shall be provided to permit the visual determination of the location of a reference plane. This reference plane can be offset from the location of the tomographic planes.

(C) If a device using a light source is used, the light source shall provide illumination levels sufficient to permit the visual determination of the location of the tomographic plane or reference plane under ambient light conditions of up to 500 lux.

(3) Beam-on and shutter-status indicators and control switches.

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

(B) Each emergency button or switch shall be clearly labeled as to its function.
(4) Indication of CT conditions of operation. The CT X-ray system shall be designed so that the CT conditions of operation to be used during a scan or a scan sequence shall be indicated before the initiation of a scan or a scan sequence. This requirement may be met by permanent markings on equipment that has all or some of these conditions of operation at fixed values. An indication of the CT conditions of operation shall be visible from any position from which scan initiation is possible.

(5) Extraneous radiation. When data are not being collected for image production, the radiation adjacent to the tube port shall not exceed the levels permitted in these regulations.

(6) Maximum surface CTDI identification. The angular position where the maximum surface CTDI occurs shall be identified to allow for the reproducible positioning of a CT dosimetry phantom.

(7) Additional requirements applicable to CT X-ray systems containing a gantry manufactured after September 3, 1985.

(A) The total error in the indicated location of the tomographic plane or reference plane shall not exceed five millimeters.

(B) If the X-ray production period is less than one-half second, the indication of X-ray production shall be actuated for at least one-half second. Indicators at or near the gantry shall be discernible from any point external to the patient opening where insertion of any part of the human body into the primary beam is possible.

(C) The deviation of the indicated scan increment versus the actual increment shall not exceed plus or minus one millimeter for any mass weighing from 0 to 100 kilograms and resting on the support device. The patient-support device shall be adjusted in increments from a typical starting position to the maximum distance or 30 centimeters, whichever is less, and then returned to the starting position. Measurement of actual versus indicated scan increment may be taken anywhere along this range of positions.

(D) Premature termination of the X-ray exposure by the operator shall necessitate the resetting of the CT conditions of operation before the initiation of another scan.

(c) Facility design requirements.
(1) Aural communication. Provision shall be made for two-way aural communication between the patient and the operator at the control panel.

(2) Viewing systems.
   (A) Windows, mirrors, closed-circuit television, or an equivalent shall be provided to permit continuous observation of the patient during irradiation and shall be located so that the operator can observe the patient from the control panel.
   (B) If the primary viewing system is an electronic means, an alternate viewing system, which may be electronic, shall be available for use if the primary viewing system fails.

(d) Surveys, calibrations, spot checks, and operating procedures.
   (1) Surveys.
      (A) All CT X-ray systems installed after the effective date of this regulation and those systems not previously surveyed shall have a survey performed by, or under the direction of, a qualified expert. In addition, the surveys shall be performed after each change in the facility or equipment that might cause a significant increase in radiation hazard.
      (B) Each registrant shall obtain a written report of the survey from the qualified expert. The registrant shall make a copy of the report available to the department upon request.
   (2) Radiation calibrations.
      (A) The calibration of the radiation output of the CT X-ray system shall be performed by, or under the direction of, a qualified expert who is physically present at the facility during the calibration.
      (B) The calibration of each CT X-ray system shall be performed at the intervals specified by a qualified expert and after any change or replacement of components that, in the opinion of the qualified expert, could cause any change in the radiation output.
      (C) The calibration of the radiation output of each CT X-ray system shall be performed with a calibrated dosimetry system. The calibration of the system shall be traceable to a national standard. The dosimetry system shall have been calibrated within the preceding two years.
      (D) One or more CT dosimetry phantoms shall be used in determining the radiation output of a CT X-ray system. Each
phantom shall meet all of the following requirements and conditions of use:

(i) Each CT dosimetry phantom shall consist of right-circular cylinders of polymethyl methacrylate with a density of 1.19 plus or minus 0.01 grams per cubic centimeter. Each phantom shall be at least 14 centimeters in length and shall have a diameter of 32.0 centimeters for testing CT X-ray systems designed to image any section of the body and 16.0 centimeters for systems designed to image the head or for whole-body scanners operated in the head-scanning mode.

(ii) Each CT dosimetry phantom shall provide a means for the placement of one or more dosimeters along the axis of rotation and along a line parallel to the axis of rotation at 1.0 centimeter from the outer surface and within the phantom. A means for the placement of dosimeters or alignment devices at other locations may be provided.

(iii) The effect on the doses measured due to the removal of phantom material to accommodate dosimeters shall be accounted for, through appropriate corrections to the reported data by inclusion in the statement of maximum deviation for the value obtained using the phantom.

(iv) All dose measurements shall be performed with the CT dosimetry phantom placed on the patient couch or support device without additional attenuation materials present.

(E) Calibration shall be required for each type of head, body, or whole-body scan performed at the facility.

(F) Calibration shall meet all of the following requirements:

(i) The dose profile along the center axis of the CT dosimetry phantom for the minimum, maximum, and midrange values of the nominal tomographic section thickness used by the registrant shall be measurable. If fewer than three nominal tomographic thicknesses can be selected, the dose profile determination shall be performed for each available nominal tomographic section thickness.

(ii) The CTDI along the two axes shall be measured. The CT dosimetry phantom shall be oriented so that the measurement point at 1.0 centimeter from the outer surface and within the phantom is in the same angular position within the gantry as the point of maximum surface CTDI identified. The CT conditions of operation shall correspond to typical values used by the registrant.

(iii) The required spot checks shall be made.
(G) The calibration procedures shall be in writing. Records of all calibrations performed shall be maintained for inspection by the department.

(3) Spot checks.
   (A) The spot check procedures shall be in writing and shall have been developed by a qualified expert.
   (B) The spot check procedures shall incorporate the use of a CT dosimetry phantom that has a capability of providing an indication of contrast scale, noise, nominal tomographic section thickness, and the resolution capability of the system for low-contrast and high-contrast objects, and of measuring the mean CTN for water or other reference material.
   (C) All spot checks shall be included in the calibration and shall be made at time intervals and under system conditions specified by a qualified expert.
   (D) The spot checks shall include acquisition of images obtained with the CT dosimetry phantom or phantoms using the same processing mode and CT conditions of operation that are used to perform calibrations. The images shall be retained in two forms as follows, until a new calibration is performed:
      (i) Photographic copies of the images obtained from the image display device; and
      (ii) images stored in digital form on a storage medium compatible with the CT X-ray system.
   (E) Written records of the spot checks performed shall be maintained for inspection by the department.

(4) Operating procedures.
   (A) The CT X-ray system shall not be operated except by an individual who has been specifically trained in its operation.
   (B) Information shall be available at the control panel regarding the operation and calibration of the system. This information shall include the following:
      (i) The dates of the latest calibration and spot checks and the location within the facility where the results of those tests can be obtained;
      (ii) instructions on the use of the CT dosimetry phantom or phantoms, including the schedule of spot checks appropriate for the system, the allowable variations for the indicated parameters, and
the results of at least the most recent spot checks conducted on the system;

(iii) the distance in millimeters between the tomographic plane and the reference plane, if a reference plane is utilized; and

(iv) a current technique chart available at the control panel that specifies, for each routine examination, the CT conditions of operation and the number of scans per examination. (Authorized by and implementing K.S.A. 48-1607; effective Dec. 30, 2005.)


28-35-251. Veterinary medicine radiography.
(a) Equipment.
(1) One or more diaphragms or cones shall be provided for collimating the useful beam to the area of clinical interest.
(2) A device shall be provided to terminate the exposure at a preset time.
(3) A dead-man type of exposure switch shall be provided, together with an electrical cord of sufficient length so that the operator can stand outside of the useful beam and at least two meters or six feet from the animal during each X-ray exposure.
(b) Structural shielding. All wall, ceiling, and floor areas shall be equivalent to, or provided with the shielding or applicable protective barriers that are necessary to ensure compliance with K.A.R. 28-35-212a [p.192] and K.A.R. 28-35-214a [p.206].
(c) Operating procedures.
(1) The operator shall stand outside of the useful beam and away from the animal during each radiographic exposure.
(2) No individual other than the operator shall be in the X-ray room while exposures are being made unless the individual's assistance is required.
(3) When an animal must be held in position during radiography, mechanical supporting or restraining devices shall be used if practical. If the animal must be held by an individual, that individual shall be protected with appropriate shielding devices, which may include protective gloves and an apron, and shall be positioned so that no part of the individual's body will be struck by the useful beam. The thickness of each shielding device used shall be the same as that required by K.A.R. 28-35-242a (a)(5) and (7) [p.251]. The exposure of any individual who consistently assists with restraining animals during radiography shall be monitored. (Authorized by K.S.A. 48-1607; effective Jan. 1, 1970; amended May 1, 1976; amended Sept. 20, 1993; amended Dec. 30, 2005.)


28-35-255. Healing arts screening. Each person who wants to conduct a healing arts screening program shall be required to obtain the secretary's written approval before initiating the program. Each person requesting that the secretary approve a healing arts screening program shall submit the following information and evaluations:

(a) The name and address of the applicant and, if applicable, the names and addresses of the applicant's agents within this state;
(b) the diseases or conditions for which the X-ray examinations are to be used in diagnoses;
(c) a detailed description of the X-ray examinations proposed in the screening program;
(d) a description of the population to be examined in the screening program, including age, sex, physical condition, and any other relevant information;
(e) an evaluation of any known alternate methods not involving ionizing radiation that could achieve the goals of the
screening program and the reason why these methods are not used instead of the X-ray examinations;

(f) an evaluation by a qualified expert of the X-ray system or systems to be used in the screening program. The evaluation by the qualified expert shall show that each system meets all requirements of these regulations;

(g) a description of the quality control program for diagnostic film;

(h) a copy of the technique chart for the X-ray examination procedures to be used;

(i) the qualifications of each individual who would be operating each X-ray system;

(j) the qualifications of the individual who would be supervising the operators of the X-ray systems. The extent of supervision and the method of work performance evaluation shall be specified;

(k) the name and address of the individual who would interpret each radiograph;

(l) a description of all procedures to be used in advising each individual screened and the individual's private practitioner of the healing arts of the results of the screening procedure and any further medical needs indicated;

(m) a description of all procedures to be used for the retention or disposition of the radiographs and other records pertaining to each X-ray examination; and

(n) a specification of the proposed frequency of screening and the proposed duration of the entire screening program.

(Authorized by and implementing K.S.A. 48-1607; effective Sept. 20, 1993; amended Dec. 30, 2005.)

28-35-256. Training for X-ray system operators. The following subjects shall be included in the training of X-ray equipment operators, as applicable:

(a) Familiarization with the following:

(1) Identification of controls;
(2) the function of each control; and
(3) how to use technique charts;

(b) radiation protection using the following:

(1) Collimation;
(2) filtration;
(3) gonad shielding and, if used, other patient protection devices;
(4) restriction of X-ray tube radiation to the image receptor;
(5) personnel protection; and
(6) grids;

(c) film processing, including the following:

(1) Film speed as related to the patient's exposure to
radiation; (2) film processing parameters; and (3) a quality assurance program; (d) emergency procedures, which shall include the termination of exposure if an automatic timing device fails; (e) the proper use of personnel dosimetry, if required; and (f) understanding the units of radiation. (Authorized by and implementing K.S.A. 48-1607; effective Dec. 30, 2005.)

Part 6. Use of Sealed Radioactive Sources in the Healing Arts


28-35-264. General requirements. The provisions of 10 C.F.R. part 35, as in effect on September 9, 2015, are hereby adopted by reference, with the changes specified in this regulation.

(a) For the purposes of part 6, "byproduct material" shall mean all radioactive material regulated by the department.

(b) All reports required by this regulation shall be submitted to the department.

(c) The following sections shall be deleted:

(1) 35.1, "purpose and scope";

(2) 35.2, "definitions," except that the definitions of the following terms shall be retained:

(A) "Authorized medical physicist";

(B) "authorized nuclear pharmacist";

(C) "authorized user";

(D) "medical event";

(E) "prescribed dose"; and
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(F) "radiation safety officer";
(3) 35.8, "information collection requirements: OMB approval";
(4) 35.18, "license issuance";
(5) 35.19, "specific exemptions";
(6) 35.26(a)(1), "radiation protection program changes";
(7) 35.4001, "violations"; and
(8) 35.4002, "criminal penalties."

d) Wherever the following C.F.R. references occur within 10 C.F.R. part 35, these references shall be replaced with the specified references to regulations and parts in this article:

(1) "10 CFR 19.12" shall be replaced with "K.A.R. 28-35-333 [p.329], 'instructions to workers.'"
(2) "10 CFR part 20" shall be replaced with "part 4, 'standards for protection against radiation.'"
(3) "10 CFR 20.1101" shall be replaced with "K.A.R. 28-35-211d [p.191], 'radiation protection programs.'"
(4) "10 CFR 20.1301(a)(1) and 20.1301(c)" shall be replaced with "K.A.R. 28-35-214a [p.206]."
(5) "10 CFR 20.1501" shall be replaced with "K.A.R. 28-35-217b [p.211]."
(6) "10 CFR part 30" shall be replaced with "part 3, 'licensing of sources of radiation.'"
(7) "10 CFR 32.72" shall be replaced with "K.A.R. 28-35-181m [p.123], 'specific licenses to manufacture and distribute radiopharmaceuticals containing radioactive material for medical use under group licenses,' and K.A.R. 28-35-181n [p.127], 'specific licenses to manufacture and distribute generators or reagent kits for preparation of radiopharmaceuticals containing radioactive material.'"
(8) "10 CFR 32.74" shall be replaced with "K.A.R. 28-35-181o [p.128], 'specific licenses to manufacture and distribute sources and devices for use as a calibration or reference source, or for certain medical uses.'"
(9) "10 CFR 33.13" shall be replaced with "K.A.R. 28-35-182b [p.137], 'qualifications for a type A specific license of broad scope.'"

e) Wherever the following terms occur within 10 C.F.R. part 35, these terms shall be replaced with "department":

(1) "Commission";
(2) "NRC operation center"; and
(3) "NRC regional office."

(f) The following changes shall be made to the sections specified:

(1) 35.6(b)(1) and (c)(1) shall be replaced with the following text: "Obtain review and approval of the research as specified in 45 CFR 46.111, 'criteria for IRB approval of research'; and".

(2) 35.6(b)(2) and (c)(2) shall be replaced with the following text:"Obtain informed consent from the human research subject as specified in 45 CFR 46.116, 'general requirements for informed consent.' "

(3) 35.10, subsection (a) shall be deleted.

(4) In 35.10(d), the date "October 24, 2002" shall be replaced with "the effective date of these regulations." 

(5) 35.12(b)(1) shall be replaced with the following text: "submitting a form specified by the department that includes the facility diagram, equipment, and training and experience qualifications of the radiation safety officer, authorized users, authorized physicists, and authorized pharmacists." 

(6) 35.12(c)(1)(i) shall be replaced with the following text: "a form specified by the department that includes the facility diagram, equipment, and training and experience qualifications of the radiation safety officer, authorized users, authorized physicists, and authorized pharmacists." 

(7) In 35.57(a)(1) and (b)(1), the date "October 24, 2002" shall be replaced with "the effective date of these regulations."

(8) In 35.57(a)(2) and (b)(2), the date "April 29, 2005" shall be replaced with "the effective date of these regulations."

(9) In 35.432(a), the date "October 24, 2002" shall be replaced with "the effective date of these regulations."

(10) In 35.3045, the footnote shall be deleted, and in subsection (a) the words "or any radiation-producing device" shall be added before the words "results in."

(11) 35.3047(d) shall be replaced with the following text: "The licensee shall submit a written report to the department within 15 days after discovery of a dose to the embryo or fetus, or nursing child that requires a report in paragraphs (a) or (b) in this section."

(12) In 35.3067, the phrase "with the department" shall be inserted after the word "report" in the first sentence, and the second
sentence shall be deleted. (Authorized by and implementing K.S.A. 48-1607; effective Dec. 30, 2005; amended March 18, 2011; amended May 4, 2018.)

Part 7. Special Requirements for Industrial Radiographic Operations


28-35-274. Applicability. (a) The regulations in this part shall apply to all persons who utilize sources of radiation for industrial radiography, except those persons who are licensed or registered in the state of Kansas to engage in the practice of the healing arts, dentistry, podiatry, or veterinary medicine. The requirements of this part shall be in addition to, and not in substitution for, the other requirements of these regulations.


28-35-275. Limits on levels of radiation for radiographic exposure devices and storage containers. Radiographic exposure devices measuring less than four inches from the sealed source storage position to any exterior surface of the device shall have no radiation level in excess of 50 milliroentgens per hour at six inches from any exterior surface of the device. Radiographic exposure devices measuring four or more inches from the sealed source storage position to any exterior surface of the device, and all storage containers for sealed sources or outer containers for radiographic exposure devices, shall have no radiation level in excess of 200 milliroentgens per hour at any exterior surface, or in excess of 10 milliroentgens per hour at one meter from any exterior surface. The radiation level emanating from a device or container shall be measured with the sealed source in the shielded position.
28-35-276. Locking sources of radiation. (a) Each radiographic exposure device shall have a lock or outer locked container designed to prevent unauthorized or accidental removal of the sealed source from its shielded position. The exposure device or its container, or both, shall be kept locked when not under the direct surveillance of a radiographer or a radiographer's assistant except at permanent radiographic installations as specified in K.A.R. 28-35-285 [p.306]. In addition, during radiographic operations the sealed source assembly shall be secured in the shielded position each time the source is returned to that position.

(b) Each sealed source storage container and source changer shall have a lock or outer locked container designed to prevent unauthorized or accidental removal of the sealed source from its shielded position. Storage containers and source changers shall be kept locked when containing sealed sources except when under the direct surveillance of a radiographer or a radiographer's assistant or when being transported.

(c) The control panel of each radiation machine shall be equipped with a lock that prevents the unauthorized use of an X-ray system or the accidental production of radiation. Each radiation machine shall be kept locked with the key removed at all times, except when the machine is under the direct visual surveillance of a radiographer or a radiographer's assistant.


28-35-277a. Conducting industrial radiographic operations. (a) If radiography is performed at a location other than a permanent radiographic installation, the radiographer shall be accompanied by at least one other qualified radiographer or an individual who has at a minimum met the requirements specified in K.A.R. 28-35-289 [p.309]. The additional qualified individual shall observe the operations and shall be capable of providing immediate assistance to prevent unauthorized entry. Radiography shall not be performed if only one qualified individual is present.

(b) All radiographic operations shall be conducted in a permanent radiographic installation unless otherwise specifically authorized by the secretary.

(c) Except when physically impossible, collimators shall be used in industrial radiographic operations that use radiographic exposure devices that allow the source to be moved out of the device.

(d) Any licensee or registrant may conduct laybarge, offshore-platform, or underwater radiography only if the licensee's or registrant's procedures have been approved by the secretary, the nuclear regulatory commission, or another agreement state. (Authorized by and implementing K.S.A. 48-1607; effective Dec. 30, 2005.)

28-35-278. Radiation survey instruments. (a) Each licensee or registrant shall maintain calibrated and operable radiation survey instruments to make physical radiation surveys as required by this part. The instrumentation required by this subsection shall have a range capable of measuring two milliroentgens per hour through one roentgen per hour.

(b) Each radiation survey instrument shall be calibrated as follows:

(1) At energies appropriate for use;

(2) at intervals not to exceed six months and after each instrument servicing;

(3) with a demonstrated accuracy within plus or minus 20 percent; and

(4)(A) For linear scale instruments, at two points located approximately one-third and two-thirds of full scale on each scale;

(B) for logarithmic scale instruments, at midrange of each decade and at two points of at least one decade; and
(C) for digital instruments, at three points between two and 1,000 mrem per hour.

(c) Each licensee or registrant shall maintain records of the calibrations specified in this regulation for two years after the calibration date. (Authorized by and implementing K.S.A 48-1607; effective Jan. 1, 1970; amended, T-85-43, Dec. 19, 1984; amended May 1, 1985; amended Dec. 30, 2005.)

28-35-279. Leak testing, repair, tagging, opening, modification, and replacement of sealed sources. (a) The replacement of any sealed source fastened to, or contained in, a radiographic exposure device, leak testing, repair, tagging, opening, and any other action involving a sealed source shall be performed only by persons specifically authorized to do so by the department, the United States nuclear regulatory commission, or an agreement state.

(b) Each sealed source shall be tested for leakage at intervals not to exceed six months. In the absence of a certificate from a transferor that a leak test has been made within the six-month period before transfer, the sealed source shall not be put into use until leak tested.

(c) The leak test shall be capable of detecting the presence of 0.005 microcuries of removable contamination. Leak tests shall be performed by wiping appropriate accessible surfaces and measuring the level of transferred contamination on the wipes. Records of leak test results shall be kept in units of microcuries and maintained for two years.

(d) If any leak test reveals the presence of 0.005 microcuries or more of removable radioactive material, the sealed source shall be considered to be leaking. The licensee shall immediately withdraw the equipment involved from use and shall cause the equipment to be decontaminated and repaired, or to be disposed of, in accordance with these regulations. Within five days after obtaining results of any leak test indicating a leaking source, the licensee shall file a report with the department describing the equipment involved, the test results, and the corrective action taken, if any.

(e)(1) Each exposure device using depleted uranium (DU) shielding and an S-tube configuration shall be tested for DU
contamination at least each 12 months. The test shall be capable of detecting the presence of 0.005 microcuries of radioactive material on the test sample and shall be performed by a person specifically authorized to perform the test by the department, the nuclear regulatory commission, or another agreement state. The records of each DU contamination test shall be retained for two years.

(2) If the test reveals the presence of DU contamination, the exposure device shall be removed from use until an evaluation of any degeneration of the S-tube is made. If the evaluation reveals that the S-tube is worn through, the device shall not be used again. DU-shielded devices shall not be required to be tested for DU contamination while in storage and not in use. Before using or transferring the device, the device shall be tested for DU contamination if the interval of storage exceeded 12 months.


28-35-280. Quarterly inventory. Each licensee shall conduct a quarterly inventory to account for all sealed sources and for all devices containing depleted uranium received or possessed by the licensee. The licensee shall maintain these inventory records for two years following the date of the inventory and shall include the following information:

(a) The quantities and kinds of sources and devices containing depleted uranium inventoried;
(b) the location of the sources and devices containing depleted uranium at the time of inventory; and
(c) the date on which the inventory was conducted.


28-35-281. Utilization logs. (a) Each licensee or registrant shall maintain a log for each source of radiation, which shall contain the following information:

(1) The make and model number, or a detailed description, of the source of radiation or storage container to which the log pertains;
(2) the name and signature of the radiographer to whom the source or container is assigned;
(3) the plant or site where the source or container is used;
(4) the date or dates when the source or container is used; and
(5) the voltage, current, and exposure time for each radiographic exposure made with a radiation machine.

(b) Each licensee or registrant shall retain the logs required by this regulation for three years. (Authorized by and implementing K.S.A. 48-1607; effective Jan. 1, 1970; amended, T-85-43, Dec. 19, 1984; amended May 1, 1985; amended Dec. 30, 2005.)

28-35-282. General requirements. (a) Each radiographer's assistant shall be under the personal supervision of a radiographer when using any radiographic exposure device, any associated equipment, or a sealed source, or while conducting radiation surveys to determine that the sealed source has returned to the shielded position or that the radiation machine is shut off after each exposure. The personal supervision shall include the following:

(1) The radiographer's physical presence at the site where the sources of radiation are being used;
(2) the availability of the radiographer to provide immediate assistance, if required; and
(3) the radiographer's direct observation of the assistant's performance of the operations.

(b) Each licensee or registrant shall conduct an internal audit program to ensure that the agency's radioactive material license conditions and the licensee's or registrant's operating and emergency procedures are followed by each radiographer and radiographer's assistant. These internal audits shall be performed at least quarterly, and each radiographer shall be audited at least quarterly. A record of each internal audit shall be maintained for departmental inspection for two years after the date of the audit. (Authorized by and implementing K.S.A. 48-1607; effective Jan 1, 1970; amended May 1, 1976; amended, T-85-43, Dec. 19, 1984; amended May 1, 1985; amended Sept. 20, 1993; amended Dec. 30, 2005.)

28-35-282a. Inspection and maintenance of radiation machines, radiographic exposure devices, transport and storage...
containers, associated equipment, source changers, and survey instruments. (a) Each licensee or registrant shall perform visual and operability checks on the survey meters, radiation machines, radiographic exposure devices, each transport and storage container, and any associated equipment and source changers before each day's use, or each work shift, to ensure that all of the following conditions are met:

1. The equipment is in good working condition.
2. The sources are shielded.
3. The required labeling is present.

(b) Survey instrument operability shall be performed by using check sources or other appropriate means.

(c) If equipment problems are found, the equipment shall be removed from service until repaired.

(d) Each licensee or registrant shall have written procedures for and shall perform inspections and routine maintenance on the radiation machines, radiographic exposure devices, source changers, associated equipment, transport and storage containers, and survey instruments. The inspections and maintenance shall occur at least every three months or before the next use to ensure the proper functioning of components important to safety. If equipment problems are found, the equipment shall be removed from service until repaired.

(e) The licensee's inspection and maintenance program shall include procedures to ensure that type B packages are shipped and maintained in accordance with the certificate of compliance or other type of approval.

(f) Each licensee or registrant shall maintain records of inspection, equipment problems, and any maintenance performed under this regulation for three years. These records shall indicate the following:

1. The date of the check or inspection;
2. the name of the inspector;
3. the equipment modified;
4. any problems found; and
5. any repairs needed and any maintenance and equipment problems found. (Authorized by and implementing K.S.A. 48-1607; effective Dec. 30, 2005.)
28-35-282b. Permanent radiographic installations. (a) Each entrance that is used for access by personnel to the high-radiation area in a permanent radiographic installation shall have either of the following:

(1) An entrance control of the type described in K.A.R. 28-35-219a [p.212] that causes the radiation level upon entry into the area to be reduced; or

(2) both conspicuous visible and audible warning signals to warn of the presence of radiation. The visible signal shall be actuated by radiation whenever the source is exposed or the machine is energized. The audible signal shall be actuated whenever an attempt is made to enter the installation while the source is exposed or the machine is energized.

(b) The alarm system shall be tested for proper operation with a radiation source each day before the installation is used for radiographic operations. The test shall include a check of both the visible and audible signals. Entrance control devices that reduce the radiation level upon entry as specified in paragraph (a) (1) shall be tested monthly.

(c) If an entrance control device or an alarm is operating improperly, the device or alarm shall be immediately labeled as defective and repaired within seven calendar days. The facility may continue to be used during this seven-day period, if the licensee or registrant implements the continuous surveillance requirements of K.A.R. 28-35-285 [p.306] and uses an alarming ratemeter.

(d) The test records for entrance controls and audible and visual alarms shall be maintained for three years. (Authorized by and implementing K.S.A. 48-1607; effective Dec. 30, 2005.)

28-35-282c. Labeling, storage, and transportation. (a) The licensee shall not use a source changer or storage container to store radioactive material unless the source changer or the storage container has securely attached to it a durable, legible, and clearly visible label that meets the following requirements:

(1) Bears the standard trefoil radiation caution symbol in conventional colors, which shall include magenta, purple, and black on a yellow background;

(2) has a minimum diameter of 25 mm; and

(3) displays the following wording:
(b) The licensee shall not transport radioactive material unless the material is packaged and the package is labeled, marked, and accompanied with appropriate shipping papers in accordance with U.S. department of transportation regulations.

(c) Radiographic exposure devices, source changers, storage containers, and radiation machines shall be physically secured to prevent tampering or removal by unauthorized personnel. The licensee shall store all radioactive material in a manner that will minimize danger from explosion or fire.

(d) The licensee shall lock and physically secure all transport packages containing radioactive material in the transporting vehicle to prevent accidental loss, tampering, and unauthorized removal.

(e) The licensee's name and the name of the city or town where the main business office is located shall be prominently displayed by affixing a durable, clearly visible label on each side of any vehicle used to transport radioactive material or radiation machines for temporary use at a job site. (Authorized by and implementing K.S.A. 48-1607; effective Dec. 30, 2005.)

28-35-282d. Radiation safety officer. Each radiation safety officer shall ensure that radiation safety activities are being performed in accordance with approved procedures and regulatory requirements in the daily operation of the licensee's or registrant's program.

(a) The minimum qualifications, training, and experience for a radiation safety officer for industrial radiography shall be the following:

(1) Completion of the training and testing requirements of K.A.R. 28-35-289 [p.309];
(2) 2,000 hours of hands-on experience as a qualified radiographer in industrial radiographic operations; and
(3) formal training in the establishment and maintenance of a radiation protection program.
(b) Alternatives to the requirements specified in subsection (a) may be considered by the secretary if the radiation safety officer has training and experience in the field of ionizing radiation and, in addition, has adequate formal training with respect to the establishment and maintenance of a radiation safety protection program.

(c) The specific duties and authorities of the radiation safety officer shall include the following:

(1) Establishing and overseeing all operating, emergency, and ALARA procedures as required by part 4 of these regulations and reviewing the procedures regularly to ensure that the procedures conform to the department's regulations and to the license or registration conditions;

(2) overseeing and approving the training program for radiographic personnel to ensure that appropriate and effective radiation protection practices are taught;

(3) ensuring that required radiation surveys and leak tests are performed and documented in accordance with these regulations, including any corrective measures when levels of radiation exceed established limits;

(4) ensuring that personnel monitoring devices are calibrated, if applicable, and used properly, that records are kept of the monitoring results, and that timely notifications are made as required by part 4 of these regulations; and

(5) ensuring that operations are conducted safely and for implementing corrective actions including terminating operations.

(d) Each licensee and registrant shall have two years after the effective date of this regulation to meet the requirements of K.A.R. 28-35-282a [p.299] and K.A.R. 28-35-282b [p.301].

(Authorized by and implementing K.S.A. 48-1607; effective Dec. 30, 2005.)

28-35-283. Operating and emergency procedures. (a) At a minimum, the operating and emergency procedures of each licensee or registrant shall include instructions in the following areas:

(1) The proper handling and use of sources of radiation, so that no person is likely to receive a radiation exposure in excess of the limits specified in part 4 of these regulations;
(2) the methods of, and occasions for, conducting radiation surveys;

(3) the methods of controlling access to areas where radiography is being performed;

(4) the methods of, and occasions for, locking and securing sources of radiation, transport containers, storage containers, and exposure devices;

(5) personnel monitoring and the use of personnel-monitoring equipment, including steps that shall be taken immediately by radiography personnel if a pocket dosimeter is found to be offscale;

(6) transporting sources of radiation to field locations, including packing sources of radiation in a vehicle, posting signs or placards on a vehicle in which a source of radiation is to be transported, and controlling sources of radiation during transportation;

(7) the procedures for minimizing the exposure of individuals if an accident, including a source disconnect, transport accident, or loss of a source of radiation, occurs;

(8) source recovery procedures if the licensee will perform source recoveries;

(9) the procedures for notifying the appropriate persons if an accident occurs;

(10) the maintenance of records; and

(11) the inspection, maintenance, and operability checking of radiographic exposure devices, storage containers, transport containers, radiation machines, survey instruments, and alarming ratemeters.

(b) Each licensee shall maintain a copy of the current operating and emergency procedures until the department terminates the license. A copy of all superseded operating and emergency procedures shall be maintained for three years after the procedures have been superseded. (Authorized by and implementing K.S.A. 48-1607; effective Jan. 1, 1970; amended Jan. 1, 1972; amended, T-85-43, Dec. 19, 1984; amended May 1, 1985; amended Dec. 30, 2005.)

28-35-284. Personnel monitoring. (a) The licensee or registrant shall not permit any individual to act as a radiographer or a radiographer's assistant unless, at all times during radiographic
operations, each individual wears on the trunk of the body a personnel-monitoring device (PMD) as specified in K.A.R. 28-35-217a [p.210], a direct reading dosimeter, and an alarming ratemeter. At permanent radiographic installations where other appropriate alarming or warning devices are in routine use and during radiographic operations using radiation machines, the use of an alarming ratemeter shall not be required.

(1) Each pocket ion-chamber dosimeter shall have a range from zero to 200 mrem and shall be recharged at the start of each work shift. Electronic personal dosimeters may be used in place of only pocket ion-chamber dosimeters.

(2) Each PMD shall be assigned to and worn by only one individual.

(3) Each PMD shall be exchanged at least monthly.

(4) After replacement, each PMD shall be returned to the supplier for processing within 14 calendar days after the end of the monitoring period, or as soon as practicable. In circumstances that make it impossible to return each PMD within 14 calendar days, these circumstances shall be documented and available for review by the department.

(b) Direct reading dosimeters, including pocket ion-chamber dosimeters and electronic personal dosimeters, shall be read and the exposures shall be recorded at the beginning and end of each work shift, and records shall be maintained for two years.

(c) All pocket ion-chamber dosimeters and electronic personal dosimeters shall be checked at least each 12 months for the proper response to and the accurate measurement of radiation, and records shall be maintained for two years. An acceptable reading on each dosimeter shall be within plus or minus 30 percent of the true radiation exposure.

(d) If an individual's pocket ion-chamber dosimeter is found to be off-scale or if an electronic personal dosimeter reads greater than 200 mrem, the individual's PMD shall be sent for processing within 24 hours. In addition, the individual shall not resume any work associated with the use of sources of radiation until a determination of the amount of individual's radiation exposure is made. This determination shall be made by the radiation safety officer or the radiation safety officer's designee. The results of this determination shall be included in the records.
(e) If an individual's PMD is lost or damaged, the individual shall cease work immediately until a replacement PMD is provided and the exposure is calculated for the time period from issuance to loss or damage of the PMD. The results of the calculated exposure and the time period during which the PMD was lost or damaged shall be included in the records.

(f) Each licensee or registrant shall ensure that each alarming ratemeter meets the following requirements:

1. Is checked to ensure that the alarm functions properly before using at the start of each shift;
2. Is set to give an alarm signal at a preset dose rate of 500 mrem per hour, with an accuracy of plus or minus 20 percent of the true radiation dose rate;
3. Requires a special means to change the preset alarm function; and
4. Is calibrated at least each 12 months for the accurate measurement of radiation.

(g) Records of personnel-monitoring procedures. Each licensee or registrant shall maintain the following exposure records:

1. Direct reading dosimeter readings and yearly operability checks for two years after the record is made;
2. Records of alarm ratemeter calibrations for two years after the record is made;
3. PMD results received from the accredited NVLAP processor until the department terminates the license; and

28-35-285. Surveillance. During each radiographic operation, the radiographer or radiographer's assistant shall maintain direct visual surveillance of the operation to protect against unauthorized entry into the high-radiation area, except under either of the following circumstances:
(a) If the high-radiation area is equipped with a control device or an alarm system as specified in K.A.R. 28-35-219a [p.212]; or
(b) if the high-radiation area is locked to protect against unauthorized or accidental entry. (Authorized by and implementing K.S.A. 48-1607; effective Jan. 1, 1970; amended, T-85-43, Dec. 19, 1984; amended May 1, 1985; amended Sept. 20, 1993; amended Dec. 30, 2005.)


28-35-287. Radiation surveys and survey records. (a) No radiographic operation shall be conducted unless calibrated and operable radiation survey instruments, as specified in K.A.R. 28-35-278 [p.296], are available and used at each site where radiographic exposures are made.

(b) A survey using a radiation survey instrument shall be made after each radiographic exposure to determine that the sealed source has been returned to its shielded position. The entire circumference of the radiographic exposure device shall be surveyed. If the radiographic exposure device has a source guide tube, the survey shall include the guide tube.

(c) Before securing in a storage area any radiographic exposure device, storage container, or source changer in the manner specified in K.A.R. 28-35-276 [p.295], a survey using a radiation survey instrument shall be made to determine that each sealed source is in the shielded position.


28-35-288. Special requirements and exemptions for enclosed radiography. (a) Each licensee or registrant shall ensure
that each system for enclosed radiography that is designed to allow the admittance of any individual meets the following requirements:

(1) Meets all applicable requirements of this part and K.A.R. 28-35-214a [p.206] if the system is not a certified cabinet X-ray system;

(2) meets all applicable requirements of this part and has been certified by the U.S. food and drug administration (FDA) as compliant with the requirements in 21 C.F.R. 1020.40, if the system is a certified cabinet X-ray system; and

(3) is evaluated, at intervals not to exceed one year, to ensure compliance with the applicable requirements specified in paragraphs (1) or (2) of this subsection. A record of each evaluation shall be maintained for two years after the evaluation.


(1) Operating personnel shall be provided with personnel-monitoring equipment as specified in K.A.R. 28-35-217a [p.210].

(2) A registrant shall not permit any individual to operate a cabinet x-ray system until that individual has received a copy of and instruction in the operating procedures for the unit and has demonstrated competence in its use. A record that demonstrates compliance with this paragraph shall be maintained for inspection by the department until disposition is authorized by the department.

(3) A test for proper operation of each high-radiation area control device or alarm system, where applicable, shall be conducted and recorded as specified in K.A.R. 28-35-288 [p.307].

(c) Each permanent radiographic installation having any high-radiation area entrance control of the type specified in K.A.R. 28-35-219a [p.212] shall also meet the following requirements:

(1) Each entrance that is used for personnel access to the high-radiation area in a permanent radiographic installation shall have both a visible and an audible warning signal to warn of the presence of radiation.

(2) The visible signal shall be activated by radiation whenever the source is exposed. The audible signal shall be
activated if an attempt is made to enter the installation while the source is exposed.

(d) The control device or alarm system shall be tested for proper operation at the beginning of each period of use. A record of each test shall be prepared quarterly or before the first use after the end of the quarter. Each record shall be maintained for inspection by the department until the secretary authorizes disposal of the record. (Authorized by and implementing K.S.A. 48-1607; effective Jan. 1, 1970; amended, T-85-43, Dec. 19, 1984; amended May 1, 1985; amended Sept. 20, 1993; amended Dec. 30, 2005; amended May 4, 2018.)

28-35-289. Training requirements. (a) The licensee or registrant shall not permit any individual to act as a radiographer until the individual has completed both of the following:

(1) At least 40 hours of training in the subjects specified in subsection (g) of this regulation; and

(2) one of the following types of on-the-job training consisting of hands-on experience under the supervision of a radiographer and certification through a radiographer certification program by a certifying entity as specified in K.A.R. 28-35-293 [p.317]:

(A) If the individual will be performing industrial radiography utilizing radioactive material, on-the-job training that includes at least two months or 320 hours of active participation in the performance of industrial radiography utilizing radioactive material;

(B) if the individual will be performing industrial radiography utilizing radiation machines, on-the-job training that includes at least one month or 160 hours of active participation in the performance of industrial radiography utilizing radiation machines; or

(C) if the individual will be performing industrial radiography utilizing radioactive material and radiation machines, both segments of the on-the-job training specified in paragraphs (a)(2)(A) and (B).

(b) The licensee or registrant shall not permit any individual to act as a radiographer until the individual meets the following requirements:
(1) Has received the following:
   (A) A copy of and instruction in the requirements contained in this part;
   (B) a copy of the applicable portions of parts 4 and 10 of these regulations;
   (C) the license or registration under which the radiographer will perform industrial radiography; and
   (D) a copy of the licensee's or registrant's operating and emergency procedures;

(2) has demonstrated an understanding of the material listed in paragraphs (b)(1) (A) through (D) by successful completion of a written or oral examination;

(3) has received training in the use of the registrant's radiation machines, or the licensee's radiographic exposure services and sealed sources, in the daily inspection of devices and associated equipment and in the use of radiation survey instruments; and

(4) has demonstrated an understanding of the use of the equipment specified in paragraph (b)(3) by successful completion of a practical examination.

(c) The licensee or registrant shall not permit any individual to act as a radiographer's assistant until the individual meets the following requirements:

(1) Has received the following:
   (A) A copy of and instruction in the requirements contained in this part;
   (B) a copy of the applicable portions of parts 4 and 10 of these regulations;
   (C) the license or registration under which the radiographer's assistant will perform industrial radiography; and
   (D) a copy of the licensee's or registrant's operating and emergency procedures;

(2) has demonstrated an understanding of the material listed in paragraphs (c)(1) (A) through (D) by successful completion of a written or oral examination;

(3) under the personal supervision of a radiographer, has received training in the use of the registrant's radiation machines, or the licensee's radiographic exposure devices and sealed sources, in the daily inspection of devices and associated equipment and in the use of radiation survey instruments; and
(4) has demonstrated an understanding of the use of the equipment specified in paragraph (c)(3) by successful completion of a practical examination.

(d) Each radiographer and radiographer's assistant shall receive the annual refresher safety training at least every 12 months.

(e) The radiation safety officer or designee shall conduct an inspection program of the job performance of each radiographer and radiographer's assistant to ensure that the department's regulations, the license or registration requirements, and the operating and emergency procedures are followed. Alternatives may be considered by the secretary if the individual serves as both radiographer and radiation safety officer. In those operations in which a single individual serves as both radiographer and radiation safety officer and performs all radiography operations, an inspection program shall not be required. The inspection program shall include the following:

(1) Observation of the performance of each radiographer and radiographer's assistant during an actual industrial radiographic operation, at least every six months; and

(2) a provision that, if a radiographer or a radiographer's assistant has not participated in an industrial radiographic operation for more than six months since the last inspection, the radiographer shall demonstrate knowledge of the training requirements of paragraph (b)(3) and the radiographer's assistant shall demonstrate knowledge of the training requirements of paragraph (c)(3) by a practical examination before these individuals are allowed to participate in a radiographic operation.

(f) Each licensee or registrant shall maintain the following:

(1) Records of the training of each radiographer and radiographer's assistant. These records shall include radiographer certification documents and verification of certification status, copies of written tests, dates of oral and practical examinations, the names of individuals conducting and receiving the oral and practical examinations, a list of the subjects tested, and the results of the oral and practical examinations; and

(2) records of annual refresher safety training and semiannual inspections of job performance for each radiographer and each radiographer's assistant. These records shall list the topics discussed during the refresher safety training, the date or dates on
which the annual refresher safety training was conducted, and the
names of the instructors and attendees. For inspections of job
performance, the records shall also include a list showing the items
checked and any noncompliance observed by the radiation safety
officer.

(g) The training of each licensee or registrant shall include
information about the following:

1. Fundamentals of radiation safety, including the
   following:
   A. The characteristics of gamma radiation and X-radiation;
   B. the units of radiation dose and activity;
   C. the hazards of exposure to radiation;
   D. the levels of radiation from different sources of
      radiation; and
   E. the methods of controlling radiation dose using time,
      distance, and shielding;

2. radiation detection instruments, including the following:
   A. The use, operation, calibration, and limitations of
      radiation survey instruments;
   B. survey techniques; and
   C. the use of personnel-monitoring equipment;

3. the equipment to be used, including the following:
   A. The operation and control of radiographic exposure
      equipment, remote handling equipment, and storage containers,
      including pictures or models of source assemblies;
   B. the operation and control of radiation machines;
   C. the storage, control, and disposal of sources of radiation;

4. the requirements of state and federal regulations; and

5. case histories of accidents in radiography. (Authorized
   by and implementing K.S.A. 48-1607; effective Jan. 1, 1970;

28-35-290. Reports of incidents or of lost or stolen
sources. (a) Each licensee or registrant shall provide a written report
of all events involving radiography devices and licensed material as
specified in K.A.R. 28-35-184b [p.142], K.A.R. 28-35-228a

(b) In addition to the requirements in subsection (a), each licensee or registrant shall provide a written report to the department within 30 days after the occurrence of any of the following incidents involving radiographic equipment:

1. Unintentional disconnection of the source assembly from the control cable;
2. Inability to retract the source assembly to its fully shielded position and secure the source assembly in this position; or
3. Failure of any component that is critical to safe operation of the device to perform its intended function.

(c) Each licensee or registrant shall include the following information with each report submitted under subsection (b):

1. A description of the equipment problem;
2. A description of the cause of each incident, if known;
3. The name of the manufacturer and the model number of the equipment involved in the incident;
4. The place, time, and date of incident;
5. A description of the actions taken to establish normal operations;
6. A description of all corrective actions taken or planned to prevent reoccurrence; and
7. A description of the qualifications of the personnel involved in the incident.

(d) Each report of overexposure submitted pursuant to these regulations that involves failure of the safety components of radiography equipment shall also include the information specified in subsection (c).

(e) Each licensee or registrant conducting radiographic operations or storing sources of radiation at any location not listed on the license or registration for a period in excess of 180 days in a calendar year shall notify the department before exceeding the 180 days. (Authorized by and implementing K.S.A. 48-1607; effective Nov. 1, 1996; amended Dec. 30, 2005.)

28-35-291. Performance requirements for radiography equipment. (a) Each radiographic exposure device and all associated equipment shall have been certified by the NRC as
compliant with the requirements specified in "radiological safety for
design and construction of apparatus for gamma radiography,"
published by the American national standards institute as NBS
As an alternative, any licensee or applicant may submit an
engineering analysis demonstrating that testing previously
performed on similar individual radiography components is
adequate to support a finding that the previous testing is an
acceptable substitute for that described in the N432-1980 standards.

(b) In addition to the requirements specified in subsection
(a), the licensee shall ensure that each radiographic exposure device
and all associated equipment meet the following requirements.

(1) Each user of a radiographic exposure device shall attach
to the device a durable, legible, clearly visible label bearing the
following information:

(A) The chemical symbol and mass number of the
radionuclide in the device;
(B) the radioactive activity level and the date on which this
activity was last measured;
(C) the model number and serial number of the sealed
source;
(D) the manufacturer of the sealed source; and
(E) the licensee's name, address, and telephone number.

(2) Each radiographic exposure device intended for use as a
type B transport container shall have been certified by the NRC as
compliant with the applicable requirements of 10 C.F.R. 71.51.

(3) The licensee shall not modify any exposure device or
associated equipment in a manner that compromises the design
safety features of the system.

(c) In addition to the requirements specified in subsections
(a) and (b), the licensee shall ensure that each radiographic exposure
device and the associated equipment that allows the source to be
moved out of the device for routine operation meet the following
requirements.

(1) The coupling between the source assembly and the
control cable shall be designed so that the source assembly cannot
become disconnected if cranked outside the guide tube. The
coupling shall be designed to prevent an unintentional disconnection
under normal conditions and reasonably foreseeable abnormal
conditions.
(2) The device shall automatically secure the source assembly when the source assembly is cranked back into the fully shielded position in the device. A deliberate operation on the exposure device shall be required to release the source assembly.

(3) The outlet fitting, lock box, and drive cable fittings on each radiographic exposure device shall be equipped with safety plugs or covers, which shall be installed during storage and transportation to protect the source assembly from water, mud, sand, and other foreign matter.

(4) Each sealed source or source assembly shall have attached to it or engraved on it a durable, legible, visible label with these words: "DANGER RADIOACTIVE." The label shall not interfere with the safe operation of the exposure device or the associated equipment.

(5) Each sealed source that is not fastened to, or contained in, a radiographic exposure device shall have a durable tag permanently attached to the sealed source. The tag shall measure at least one square inch and shall bear the radiation symbol described in K.A.R. 28-35-219a [p.212] and, at a minimum, the following instructions: "Danger—Radioactive Material—Do Not Handle—Notify Civil Authorities If Found."

(6) The guide tube shall have passed the crushing tests for the control tube as specified in ANSI N432-1980 standards and a kinking resistance test that closely approximates the kinking forces likely to be encountered during use.

(7) Guide tubes shall be used when moving the source out of the device.

(8) An exposure head or similar device shall be used to prevent the source assembly from passing out of the end of the guide tube during radiographic operations.

(9) The guide tube exposure head connection shall be able to withstand the tensile test for control units specified in ANSI N432-1980 standards.

(10) Each source changer shall provide a system for ensuring that the source can not accidentally be withdrawn from the changer when connecting or disconnecting the drive cable to or from a source assembly.

(d) Each licensee shall ensure that all newly manufactured radiographic exposure devices and the associated equipment
acquired after January 10, 1995 meet the requirements of this regulation.

(e) Each licensee shall ensure that all radiographic exposure devices and associated equipment used by the licensee after January 10, 1995 meet the requirements of this regulation.

(f) Any licensee may use equipment in industrial radiographic operations that does not comply with section 8.9.2(c) of the endurance test in ANSI N432-1980 standards, if prototype equipment has been tested using a torque that an individual using the radiography equipment can realistically exert on the lever or crankshaft of the drive mechanism. (Authorized by and implementing K.S.A. 48-1607; effective Nov. 1, 1996; amended Dec. 30, 2005.)

28-35-292. Location of documents and records. (a) Each licensee or registrant shall maintain copies of records required by this part and other applicable parts of these regulations.

(b) Each licensee or registrant shall also maintain current copies of the following documents or records sufficient to demonstrate compliance at each applicable field station and each temporary job site:

1. The license or registration authorizing the use of sources of radiation;
2. a copy of parts 1, 4, 7, and 10 of these regulations;
3. the utilization logs for each source of radiation dispatched from that location;
4. the records of any equipment problems identified in daily checks of equipment;
5. the records of alarm systems and entrance control checks, if applicable;
6. the records of all dosimeter readings;
7. the operating and emergency procedures;
8. evidence of the latest calibration of the radiation survey instruments in use at the site;
9. evidence of the latest calibrations of alarming ratemeters and operability checks of dosimeters;
10. the survey records for the period of operation at the site;
11. the shipping papers for the transportation of radioactive materials; and
(12) when operating under reciprocity pursuant to part 3 of these regulations, a copy of the applicable state license or registration, or nuclear regulatory commission license authorizing the use of sources of radiation. (Authorized by and implementing K.S.A. 48-1607; effective Dec. 30, 2005; amended July 27, 2007.)

28-35-293. Requirements for an independent certifying organization. (a) Each independent certifying organization shall be required to meet the following conditions in order to be recognized by the secretary:

(1) Be an organization, including a society or association, whose members participate in, or have an interest in, the field of industrial radiography;

(2) make membership in the organization available to the general public nationwide. Membership shall not be restricted because of race, color, religion, sex, age, national origin, or disability;

(3) have a certification program that is open to nonmembers as well as members;

(4) be an incorporated, nationally recognized organization that is involved in setting national standards of practice within its fields of expertise;

(5) have an adequate staff, a viable system for financing its operations, and a policy-making and decision-making review board;

(6) have a set of written organizational bylaws and policies that provide adequate assurance of lack of conflict of interest and a system for monitoring and enforcing those bylaws and policies;

(7) have a committee, whose members shall carry out their responsibilities impartially, to review and approve the certification guidelines and procedures and to advise the organization's staff in implementing the certification program;

(8) have a committee, whose members shall carry out responsibilities impartially, to review complaints against certified individuals and to determine appropriate sanctions;

(9) have written procedures describing all aspects of the organization's certification program and maintain records of the current status of each individual's certification and the administration of the organization's certification program;
(10) have procedures to ensure that certified individuals are provided due process with respect to the administration of its certification program, including the process of becoming certified and any sanctions imposed against certified individuals;

(11) have procedures for proctoring examinations, including qualifications for proctors. These procedures shall ensure that the individuals proctoring each examination are not employed by the same company or corporation, or by a wholly owned subsidiary of the company or corporation, as that of any of the examinees;

(12) exchange information about certified individuals with the nuclear regulatory commission, other independent certifying organizations, and agreement states and allow periodic review of the organization's certification program and related records; and

(13) provide a description to the nuclear regulatory commission of the organization's procedures for choosing examination sites and for providing an appropriate examination environment.

(b) Each certification program recognized by the secretary shall meet the following requirements:

(1) Require applicants for certification to meet the following requirements:

(A) Receive training in the topics specified in K.A.R. 28-35-289 [p.309] or in equivalent state or nuclear regulatory commission regulations; and

(B) satisfactorily complete a written examination covering the topics specified in paragraph (b)(1)(A);

(2) require each applicant for certification to provide documentation demonstrating that the applicant meets the following requirements:

(A) Receives training in the topics specified in K.A.R. 28-35-289 [p.309] or in equivalent state or nuclear regulatory commission regulations;

(B) has satisfactorily completed a minimum period of on-the-job training as specified in K.A.R. 28-35-289 [p.309]; and

(C) receives verification by a state licensee or registrant or a nuclear regulatory commission licensee that the applicant has demonstrated the capability of independently working as a radiographer;

(3) include procedures to ensure that all examination questions are protected from wrongful disclosure;
(4) include procedures for denying an application and for revoking, suspending, and reinstating a certification;
(5) provide a certification period of at least three years and not more than five years;
(6) include procedures for renewing certifications and, if the procedures allow renewals without examination, require evidence of recent full-time employment and annual refresher training; and
(7) provide a timely response to inquiries from members of the public about an individual's certification status; and
(8) have requirements for written examinations that meet the following requirements:
   (A) Are designed to test an individual's knowledge and understanding of the topics specified in K.A.R. 28-35-289 [p.309] or in equivalent state or nuclear regulatory commission regulations;
   (B) are written in a multiple-choice format; and
   (C) have test items drawn from a question bank containing psychometrically valid questions based on the material specified in K.A.R. 28-35-289 [p.309]. (Authorized and implementing K.S.A. 48-1607; effective Dec. 30, 2005.)

Part 8. Radiation Safety Requirements for Analytical X-Ray Equipment

28-35-296. Purpose and scope. This part provides special requirements for analytical x-ray equipment. The requirements of this part are in addition to, and not in substitution for applicable requirements in other parts of these regulations. (Authorized by K.S.A. 1975 Supp. 48-1607; effective May 1, 1976.)

28-35-297. Equipment requirements. (A) Safety device. A device which prevents the entry of any portion of an individual's body into the primary x-ray beam path or which causes the beam to be shut off upon entry into its path shall be provided on all open-beam configurations. A licensee and/or registrant may apply to the department for an exemption from the requirement of a safety device. Such application shall include:
   (1) a description of the various safety devices that have been evaluated,
   (2) the reason each of these devices cannot be used, and
(3) a description of the alternative methods that will be employed to minimize the possibility of an accidental exposure, including procedures to assure that operators and others in the area will be informed of the absence of safety devices.

(B) **Warning devices.** Open-beam configurations shall be provided with a readily discernible indication of:

1. x-ray tube status (on-off) located near the radiation source housing, if the primary beam is controlled in this manner; and/or

2. Shutter status (open-closed) located near each port on the radiation source housing, if the primary beam is controlled in this manner. Warning devices shall be labeled so that their purpose is easily identified. On equipment installed after January 1, 1976, warning devices shall have fail-safe characteristics.

(C) **Ports.** Unused ports on radiation source housings shall be secured in the closed position in a manner which will prevent casual opening.

(D) **Labeling.** All analytical x-ray equipment shall be labeled with a readily discernible sign or signs bearing the radiation symbol and the words:

1. "CAUTION—HIGH INTENSITY X-RAY BEAM," or words having a similar intent, on the x-ray source housing;

2. "CAUTION RADIATION—THIS EQUIPMENT PRODUCES RADIATION WHEN ENERGIZED," or words having a similar intent, near any switch that energizes an x-ray tube if the radiation source is an x-ray tube; or

3. "CAUTION—RADIOACTIVE MATERIAL," or words having a similar intent, on the source housing if the radiation source is a radionuclide.

(E) **Shutters.** On open-beam configurations installed after January 1, 1976, each port on the radiation source housing shall be equipped with a shutter that cannot be opened unless a collimator or a coupling has been connected to the port.

(F) **Warning lights.** An easily visible warning light labeled with the words "X-RAY ON," or words having a similar intent, shall be located: (1) near any switch that energizes an x-ray tube and shall be illuminated only when the tube is energized; or (2) in the case of a radioactive source, near any switch that opens a housing shutter, and shall be illuminated only when the shutter is open. On
equipment installed after January 1, 1976, warning lights shall have fail-safe characteristics.

(G) *Radiation source housing.* Each x-ray tube housing shall be so constructed that with all shutters closed the leakage radiation measured at a distance of five (5) centimeters from its surface is not capable of producing a dose in excess of 2.5 millirem in one hour at any specified tube rating.

(H) *Generator cabinet.* Each x-ray generator shall be supplied with a protective cabinet which limits leakage radiation measured at a distance of five (5) centimeters from its surface such that it is not capable of producing a dose in excess of 0.25 millirem in one hour. (Authorized by K.S.A. 1975 Supp. 48-1607; effective May 1, 1976.)

**28-35-298. Area requirements.** (a) Radiation levels. The local components of an analytical X-ray system shall be located and arranged and shall include sufficient shielding or access control so that no radiation levels exist in any area surrounding the local component group that could result in a dose to an individual present therein in excess of the dose limits specified in K.A.R. 28-35-214a [p.206]. For systems utilizing X-ray tubes, these levels shall be met at each specified tube rating.

(b) Surveys. Radiation surveys, as specified in K.A.R. 28-35-139(a) [p.54], of all analytical X-ray systems sufficient to show compliance with K.A.R. 28-35-298(a) [p.321] shall be performed as follows:

1. At the time of installation of the equipment;
2. following any change in the initial arrangement, number, or type of local components in the system;
3. following any maintenance requiring the disassembly or removal of a local component in the system;
4. during the performance of maintenance and alignment procedures if the procedures require the presence of a primary X-ray beam when any local component in the system is disassembled or removed;
5. any time a visual inspection of the local components in the system reveals an abnormal condition; and
(6) whenever personnel-monitoring devices show a significant increase over the previous monitoring period or the readings are approaching the limits specified in these regulations.

(c) Posting. Each area or room containing analytical X-ray equipment shall be conspicuously posted with a sign or signs bearing the radiation symbol and the words "CAUTION—X-RAY EQUIPMENT," or words having a similar meaning. (Authorized by and implementing K.S.A. 48-1607; effective May 1, 1976; amended Dec. 30, 2005.)

28-35-299. Operating requirements. (a) Procedures. Normal operating procedures shall be written and available to all analytical X-ray equipment workers. No person shall be permitted to operate analytical X-ray equipment in any manner other than that specified in the normal operating procedures unless the person has obtained the prior written approval of the radiation safety officer.

(b) Bypassing. No person shall bypass a safety device unless the person has obtained the prior written approval of the radiation safety officer. If a safety device is bypassed, a readily discernible sign bearing the words "SAFETY DEVICE NOT WORKING," or words having a similar meaning, shall be placed on the radiation source housing.

(c) Repair or modification of X-ray tube systems. Except as specified in subsection (b), no operation involving the removal of covers, shielding materials, or tube housings or any modifications to shutters, collimators, or beam stops shall be performed without ascertaining that the tube is off and will remain off until safe conditions have been restored. The main switch, rather than interlocks, shall be used for each routine shutdown in preparation for repairs.

(d) Radioactive source replacement, testing, or repair. Radioactive source housings shall be opened for source replacement, leak testing, or other maintenance or repair procedures only by individuals authorized to specifically conduct these procedures under a license issued by the U.S. nuclear regulatory commission, an agreement state, or a licensing state. (Authorized by and implementing K.S.A. 48-1607; effective May 1, 1976; amended Dec. 30, 2005.)
28-35-300. Personnel requirements. (A) Instruction. No person shall be permitted to operate or maintain analytical x-ray equipment unless such person has received instruction in and demonstrated competence as to:

1. Identification of radiation hazards associated with the use of the equipment;
2. Significance of the various radiation warning and safety devices incorporated into the equipment, or the reasons they have not been installed on certain pieces of equipment and the extra precautions required in such cases;
3. Proper operating procedures for the equipment;
4. Symptoms of an acute localized exposure; and
5. Proper procedures for reporting an actual or suspected exposure.

(B) Personnel Monitoring. Finger or wrist dosimetric devices shall be provided to and shall be used by:

1. Analytical x-ray equipment workers using systems having an open-beam configuration and not equipped with a safety device; and
2. Personnel maintaining analytical x-ray equipment if the maintenance procedures require the presence of a primary x-ray beam when any local component in the analytical x-ray system is disassembled or removed. (Authorized by K.S.A. 1975 Supp. 48-1607; effective May 1, 1976.)

Part 9. Radiation Safety Requirements for Particle Accelerators

28-35-308. Applicability. (a) This part, which establishes procedures for the registration and the use of particle accelerators, shall be in addition to, and not a substitute for, other applicable provisions of these regulations.

(b) In addition to the requirements of this part, all registrants shall be subject to the requirements of parts 1, 2, 4, and 10. Registrants engaged in industrial radiographic operations shall be subject to the requirements of part 7, and registrants engaged in the healing arts shall be subject to the requirements of parts 5, 6, and 14 of these regulations. Registrants engaged in the production of radioactive material shall be subject to the requirements of part 3.
28-35-309. Registration requirements. No person shall receive, possess, use, transfer, own, or acquire a particle accelerator except as authorized in a registration issued pursuant to these regulations or as otherwise provided for in these regulations. The general procedures for registration of particle accelerator facilities are included in part 2 of these regulations. (Authorized by K.S.A. 1975 Supp. 48-1607; effective May 1, 1976.)

28-35-310. General requirements for the issuance of a registration for particle accelerators. In addition to the requirements of part 2, the registrant shall: (A) Be qualified by reason of training and experience to use the accelerator in question for the purpose intended in accordance with this part and part 4 and part 10 of these regulations and in such a manner as to minimize danger to public health and safety or property;

(B) The registrant's proposed equipment, facilities, operating and emergency procedures shall be adequate to protect health and minimize danger to public health and safety or property;

(C) The use of the particle accelerator shall not be inimical to the health and safety of the public and the users shall satisfy any applicable special requirement in regulation 28-35-311 of this regulation;

(D) The registrant shall appoint a radiation safety officer;

(E) The registrant and/or his staff shall have substantial experience in the use of particle accelerators for the intended uses;

(F) The registrant shall establish a radiation safety committee to approve, in advance, proposals for uses of particle accelerators, whenever deemed necessary by the department; and

(G) The registrant shall have an adequate training program for particle accelerator operators. (Authorized by K.S.A. 1975 Supp. 48-1607; effective May 1, 1976.)

28-35-311. Human use of particle accelerators. In addition to the requirements set forth in part 2, the registrant shall: (A) Whenever deemed necessary by the department, the registrant shall appoint a medical committee of at least three (3) members to evaluate all proposals for research, diagnostic, and therapeutic use
of a particle accelerator. Membership of the committee should include physicians expert in internal medicine, hematology, therapeutic radiology, and a person experienced in depth dose calculations and protection against radiation;

(B) The individuals designated as the users shall have substantial training and experience in deep therapy techniques or in the use of particle accelerations to treat humans; and

(C) The user must be a physician. (Authorized by K.S.A. 1975 Supp. 48-1607; effective May 1, 1976.)


28-35-313. Limitations. (A) No registrant shall permit any person to act as a particle accelerator operator until such person: (1) Has been instructed in radiation safety and shall have demonstrated an understanding thereof;

(2) Has received copies of and instruction in this part and the applicable requirements of part 4 and part 10, pertinent operating conditions and the registrant's operating and emergency procedures, and shall have demonstrated understanding thereof; and

(3) Has demonstrated competence to use the particle accelerator, related equipment, and survey instruments which will be employed in his assignment.

(B) Either the radiation safety committee or the radiation safety officer shall have the authority to terminate the operations at a particle accelerator facility if such action is deemed necessary to protect health and minimize danger to public health and safety or property. (Authorized by K.S.A. 1975 Supp. 48-1607; effective May 1, 1976.)

28-35-314. Shielding and safety design requirements. (a) An expert who is qualified in shielding and safety design requirements shall be consulted in the design of each particle accelerator installation and shall perform a radiation survey when the accelerator is first capable of producing radiation.

(b) Each particle accelerator installation shall be provided with the primary barriers or secondary barriers, or both, necessary to ensure compliance as specified in K.A.R. 28-35-212a [p.192] and
28-35-315. Particle accelerator controls and interlock systems. (A) Instrumentation, readouts and controls on the particle accelerator control console shall be clearly identified and easily discernible. 

(B) All entrances into a target room or other high radiation area shall be provided with interlocks that shut down the machine under conditions of barrier penetration. 

(C) When an interlock system has been tripped, it shall only be possible to resume operation of the accelerator by manually resetting controls at the position where the interlock has been tripped, and lastly at the main control console. 

(D) Each safety interlock shall be on a circuit which shall allow its operation independently of all other safety interlocks. 

(E) All safety interlocks shall be fail safe, i.e., designed so that any defect or component failure in the interlock system prevents operation of the accelerator. 

(F) A scram button or other emergency power cutoff switch shall be located and easily identifiable in all high radiation areas. Such a cutoff switch shall include a manual reset so that the accelerator cannot be restarted from the accelerator control console without resetting the cutoff switch. (Authorized by K.S.A. 1975 Supp. 48-1607; effective May 1, 1976.) 

28-35-316. Warning devices. (a) Each location designated as a high-radiation area and each entrance to the high-radiation area shall be equipped with easily observable flashing or rotating warning lights that operate only if radiation is being produced. 

(b) Except in facilities designed for human exposure, each high-radiation area shall have an audible warning device that shall be activated for 15 seconds before the possible creation of a high-radiation area. The warning device shall be clearly discernible in all high-radiation areas and all radiation areas. 

(c) All barriers, temporary or permanent, and all pathways leading to high-radiation areas shall be identified as specified in K.A.R. 28-35-219a [p.212]. (Authorized by and implementing K.S.A. 48-1607; effective May 1, 1976; amended Dec. 30, 2005.)
28-35-317. Operating procedures. (A) Particle accelerators, when not in operation, shall be secured to prevent unauthorized use.

(B) Only a switch on the accelerator control console shall be routinely used to turn the accelerator beam on and off. The safety interlock system shall not be used to turn off the accelerator beam except in an emergency.

(C) All safety and warning devices, including interlocks, shall be checked for proper operability at intervals not to exceed three (3) months. Results of such tests shall be maintained for inspection at the accelerator facility.

(D) Electrical circuit diagrams of the accelerator, and the associated interlock systems, shall be kept current and maintained for inspection by the department and available to the operator at each accelerator facility.

(E) If, for any reason, it is necessary to intentionally bypass a safety interlock or interlocks, such action shall be: (1) Authorized by the radiation safety committee and/or radiation safety officer; (2) recorded in a permanent log and a notice posted at the accelerator control console; and (3) terminated as soon as possible.

(F) A copy of the current operating and the emergency procedures shall be maintained at the accelerator control panel. (Authorized by K.S.A. 1975 Supp. 48-1607; effective May 1, 1976.)

28-35-318. Radiation monitoring requirements. (a) Each particle accelerator facility registrant shall have available the appropriate portable monitoring equipment that is operable and is calibrated for the appropriate types and levels of radiation being produced at the facility. The equipment shall be tested for proper operation daily and calibrated at intervals not to exceed one year, and after each servicing or repair.

(b) A radiation protection survey shall be performed and documented by a qualified expert acceptable to the department each time that changes have been made in the shielding, operation, or equipment, or in the occupancy of adjacent areas.

(c) Radiation levels in each high-radiation area shall be continuously monitored. Each monitoring device shall be electrically independent of the accelerator control and interlock systems and capable of providing a remote and local readout with
visual alarms or audible alarms, or both, at both the control panel and the entrance to high-radiation areas, and other appropriate locations, so that people entering or present become aware of the existence of the hazard.

(d) All area monitors shall be calibrated at intervals not to exceed one year, and after each servicing or repair.

(e) Whenever applicable, the registrant shall make periodic surveys to determine the amount of airborne particulate radioactivity present in areas of airborne hazards.

(f) Whenever applicable, the registrant shall make periodic smear surveys to determine the degree of contamination in target and other pertinent areas.

(g) All area surveys shall be made in accordance with the written procedures established by a qualified expert or by the radiation safety officer of the particle accelerator facility.

(h) Records of all radiation protection surveys, calibration results, instrumentation tests, and smear results shall be kept current and on file at each accelerator facility. (Authorized by and implementing K.S.A. 48-1607; effective May 1, 1976; amended Dec. 30, 2005.)

28-35-319. Ventilation systems. (a) Adequate ventilation shall be provided in areas where airborne radioactivity could be produced.

(b) No registrant shall vent, release, or otherwise discharge airborne radioactive material to an uncontrolled area, except as specified in K.A.R. 28-35-214b [p.207]. (Authorized by and implementing K.S.A. 48-1607; effective May 1, 1976; amended Dec. 30, 2005.)

Part 10. Notices, Instructions and Reports to Workers; Inspections

28-35-331. Persons required to meet the requirements of this part. The requirements of this part apply to all persons who receive, possess, use, own or transfer material licensed by or registered with the department pursuant to part 2 or 3 of these regulations. (Authorized by K.S.A. 1984 Supp. 48-1607; implementing K.S.A. 1984 Supp. 48-1604, 48-1607, 48-1609; effective May 1, 1976; amended, T-85-43, Dec. 19, 1984; amended May 1, 1985.)
28-35-332. Posting of notices to workers. (a) Each licensee or registrant shall post current copies of the following documents:

(1) The regulations in this part and part 4;

(2) the license, or certificate of registration, including any conditions on the license and any document or documents incorporated into the license by reference and also any amendment to the license;

(3) the operating procedures applicable to work under the license or registration; and

(4) any notice of violation involving radiological working conditions, any order issued pursuant to Part 1, and any response from the licensee or registrant.

(b) If the posting of a document specified in paragraph (a)(1), (2), or (3) is not practicable, the licensee or registrant may post a notice which describes the document and states where it may be examined.

(c) Department form RH-3 shall be posted by each licensee or registrant where individuals work in or frequent any portion of a controlled area.

(d) Documents, notices or forms shall be posted to allow individuals engaged in work under the license or registration to observe them on the way to or from any particular work location to which the document applies, shall be conspicuous, and shall be replaced if defaced or altered.

(e) Department documents posted pursuant to paragraph (a)(4) shall be posted within two working days after receipt of the documents from the department; the licensee's or registrant's response, if any, shall be posted within two working days after dispatch from the licensee or registrant. The documents shall remain posted for a minimum of five working days or until action correcting the violation has been completed, whichever is longer. (Authorized by K.S.A. 1984 Supp. 48-1607; implementing K.S.A. 1984 Supp. 48-1604, 48-1607, 48-1609; effective May 1, 1976; amended, T-85-43, Dec. 19, 1984; amended May 1, 1985.)

28-35-333. Instructions to workers. (a) Each licensee or registrant shall ensure that each individual who is likely to receive
in a year an occupational dose in excess of 100 mrem (1 mSv) is instructed as follows:

(1) Is kept informed of the storage, transfer, or use of radioactive material or of radiation in the restricted area;
(2) is instructed in all of the following subjects:
   (A) Health protection problems associated with exposure to radioactive material or radiation to the individual and potential offspring;
   (B) precautions or procedures to minimize exposure; and
   (C) the purposes and functions of protective devices employed;
(3) is instructed in, and instructed to observe, to the extent within the worker's control, the provisions of these regulations and any licenses concerning the protection of personnel from exposures to radiation or radioactive material;
(4) is informed of the individual's responsibility to report promptly to the licensee or registrant any condition that has caused or could cause any of the following:
   (A) A violation of these regulations;
   (B) a violation of a license or registration; or
   (C) unnecessary exposure to radiation or radioactive material;
(5) is instructed in the appropriate response to warnings made in the event of any unusual occurrence or malfunction that could involve exposure to radiation or radioactive material; and
(6) is informed of the radiation exposure reports that workers may request as specified in K.A.R. 28-35-334 [p.331].

(b) In determining which individuals are subject to the requirements of subsection (a) of this regulation, each licensee or registrant shall take into consideration each individual's assigned activities during normal and abnormal situations involving exposure to radiation or radioactive material, or both, that can reasonably be expected to occur during the life of a licensed or registered facility. The extent of the instruction specified in subsection (a) shall be commensurate with the potential radiological health protection problems present in the workplace. (Authorized by K.S.A. 48-1607; implementing K.S.A. 48-1607; effective May 1, 1976; amended, T-85-43, Dec. 19, 1984; amended May 1, 1985; amended Oct. 17, 1994; amended Dec. 30, 2005.)
28-35-334. Reports to individuals. Radiation exposure data for an individual and the results of any measurements, analyses, and calculations of radioactive material deposited or retained in the body of an individual shall be reported to the individual as specified in this regulation.

(a) The information reported shall include data and results obtained pursuant to the requirements of these regulations or any order of the secretary or license condition, as shown in records maintained by the licensee or registrant pursuant to K.A.R. 28-35-227h [p.236]. Each report shall meet the following requirements:

1. Be in writing;
2. Include appropriate identifying data, including the name of the licensee or registrant, the name of the individual, and the individual's identification number, preferably social security number;
3. Include the individual's exposure information; and
4. Contain the following statement: "This report is furnished to you under the provisions of Kansas Administrative Regulation 28-35-334 [p.331]. You should preserve this report for further reference."

(b) Each licensee or registrant shall make dose information available to individual workers shown in records maintained by the licensee or registrant pursuant to K.A.R. 28-35-227h [p.236]. Each licensee or registrant shall provide an annual report to each individual worker monitored pursuant to K.A.R. 28-35-217a [p.210] of the dose received in that monitoring year if either of the following situations occurs:

1. The individual's dose exceeds 1 mSv (100 mrem) TEDE or 1 mSv (100 mrem) to any individual organ or tissue.
2. The individual requests an annual dose report.

(c) Each licensee or registrant shall furnish a written report of a worker's exposure to sources of radiation or radioactive material at the request of the worker if the worker was formerly engaged in activities controlled by the licensee or registrant. The 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 licensee or registrant, whichever is later. The report shall cover, within the period of time specified in the request, the dose record for each year the worker was required to be monitored pursuant to
K.A.R. 28-35-217a [p.210]. The report shall also include the period of time in which the worker's activities involved exposure to sources of radiation and shall include the dates and locations of work under the license or registration in which the worker participated during this period.

(d) When a licensee or registrant is required pursuant to K.A.R. 28-35-229a(a)(1) and (b)(1) [p. 240] to report to the department any exposure of an individual to sources of radiation, the licensee or the registrant shall also provide to the individual a written report of the individual's exposure data included in the report. This report shall be transmitted to the individual at a time not later than the transmittal of the report to the department.

(e) At the request of a worker who is terminating employment with the licensee or registrant that involves exposure to radiation or radioactive material or at the request of a worker who, while employed by another person, is terminating an assignment to work involving radiation dose in the licensee's facility, each licensee or registrant shall provide to the worker, or the worker's designee, a written report regarding the radiation dose received by that worker from operations of the licensee or registrant during the current year. The report shall be provided at the worker's termination. The licensee or registrant may provide a written estimate of that dose if the finally determined personnel monitoring results are not available at that time. Estimated doses shall be clearly indicated as such. (Authorized by K.S.A. 48-1607; implementing K.S.A. 48-1607 and 48-1609; effective May 1, 1976; amended, T-85-43, Dec. 19, 1984; amended May 1, 1985; amended Oct. 17, 1994; amended March 18, 2011.)

28-35-335. Presence of representatives of licensees or registrants and workers during inspection. (a) Each licensee or registrant shall afford to the department, at all reasonable times, opportunity to inspect materials, machines, activities, facilities, premises, and records maintained by the licensee or registrant.

(b) During an inspection, department inspectors may consult privately with workers as specified in K.A.R. 28-35-336 [p.333] and any amendment to that rule and regulation. The licensee or registrant may accompany department inspectors during other phases of an inspection.
(c) If, at the time of inspection, an individual has been authorized by the workers to represent them during department inspections, the licensee shall give the workers' representative an opportunity to accompany the inspectors during the inspection of physical working conditions.

(d) Each workers' representative shall be routinely engaged in work under control of the licensee or registrant and shall have received the instructions specified in K.A.R. 28-35-333 [p.329] and any amendment of that rule and regulation.

(e) Different representatives of licensees or 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 workers' representative at a time shall accompany the inspectors.

(f) With the approval of the licensee or registrant and the workers' representative, an individual who is not routinely engaged in work under control of the licensee or registrant shall be afforded the opportunity to accompany department inspectors during the inspection of physical working conditions.

(g) Department inspectors may refuse to permit accompaniment by an individual who deliberately interferes with a fair and orderly inspection. If an area to be inspected is a restricted area, the workers' representative for that area shall be an individual previously authorized by the licensee or registrant to enter that area. (Authorized by K.S.A. 1984 Supp. 48-1607; implementing K.S.A. 1984 Supp. 48-1604, 48-1607, 48-1609; effective May 1, 1976; amended, T-85-43, Dec. 19, 1984; amended May 1, 1985.)

28-35-336. Consultation with workers during inspections. (a) Department inspectors may consult privately with workers concerning matters of occupational radiation protection and other matters related to the provisions of these regulations or any condition of a license, to the extent the inspectors deem necessary for the conduct of an effective and thorough inspection.

(b) 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 worker has reason to believe may have contributed to or caused any violation of the act, these regulations, or any license condition, or any unnecessary
exposure of an individual to radiation from licensed radioactive material or a registered radiation machine under the licensee's or registrant's control. Any such notice in writing shall state clearly the condition complained of and be signed by the worker.


28-35-337. Requests by workers for inspections. (a) Any worker or representative of workers who believes that a violation of the act, these regulations or a license conditions exists or has occurred in work under a license or 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 department. 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 licensee or registrant by the department no later than at the time of inspection except that, upon the request of the worker giving the notice, the worker's name and the name of individuals referred to shall not appear in the copy or on any record published, released, or made available by the department, except for good cause shown.

(b) If, upon receipt of the notice, the department determines that the complaint meets the requirements of subsection (a), 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 the alleged violation exists or has occurred. Inspections pursuant to this section need not be limited to matters referred to in the complaint.

(c) No licensee or registrant shall discharge or in any manner discriminate against any worker because the worker has filed any complaint, or instituted or caused to be instituted any proceeding under these regulations, or has testified or is about to testify in any proceeding, or because of the exercise by the worker on behalf of the worker or others of any option afforded by this part. (Authorized by K.S.A. 1984 Supp. 48-1607; implementing K.S.A. 1984 Supp.
28-35-338. Inspections not warranted; informal review. (a) If the department determines, with respect to a complaint filed under K.A.R. 28-35-337 [p.334], and any amendments to that rule and regulation that an inspection is not warranted because there are no reasonable grounds to believe that a violation exists or has occurred, the department shall notify the complainant in writing of that determination. The complainant may obtain a review of the determination by submitting a written statement of position to the secretary, who will provide the licensee or registrant with a copy of the statement by certified mail, excluding, at the request of the complainant, the name of the complainant. The licensee or registrant may submit an opposing written statement of position to the secretary, who will provide the complainant with a copy of that statement by certified mail. Upon the request of the complainant, the secretary or the secretary's designee may hold an informal conference in which the complainant and the licensee or registrant may orally present their views. An informal conference may also be held at the request of the licensee or registrant, but disclosure of the identity of the complainant shall be made only following receipt of written authorization from the complainant. After considering all written or oral views presented, the secretary shall affirm, modify, or reverse the determination of the department and furnish the complainant and the licensee or registrant a written notification of the decision and the reason for the decision.

(b) If the secretary determines that an inspection is not warranted because the requirements of K.A.R. 28-35-337(a) [p.334] have not been met, the secretary shall notify the complainant in writing of the determination. That determination shall be without prejudice to the filing of a new complaint meeting the requirements of K.A.R. 28-35-337(a) [p.334]. (Authorized by K.S.A. 1984 Supp. 48-1607; implementing K.S.A. 1984 Supp. 48-1604, 48-1607, 48-1609; effective May 1, 1976; amended, T-85-43, Dec. 19, 1984; amended May 1, 1985.)
uses any source of radiation for wireline service operations, including mineral logging, radioactive markers, or subsurface tracer studies. The requirements of this part shall be in addition to, and not in substitution for, the requirements of Parts 1, 2, 3, 4, and 10 of these regulations. (Authorized by and implementing K.S.A. 1992 Supp. 48-1607; effective Sept. 20, 1993.)

28-35-342. Preoperational and use requirements. (a) Preoperational agreements. A licensee shall not perform any wireline service operation with a sealed source or source unless, before commencement of the operation, the licensee has a written agreement with the well operator, well owner, drilling contractor, or land owner stating the following:

(1) If a sealed source is lodged downhole, a reasonable effort at recovery will be made.

(2) No person will attempt to recover a sealed source in a manner that, in the licensee's opinion, could result in a rupture of the sealed source.

(3) If a decision is made to abandon the sealed source downhole, the requirements of K.A.R. 28-35-362 (c) [p.350] will be met.

(b) Limits on levels of radiation. All sources of radiation shall be used, stored, and transported so that the transportation and the dose limitation requirements of these regulations are met.

(c) Uranium sinker bars. Any licensee may use a uranium sinker bar in well-logging applications only if the sinker bar is legibly impressed with these words: "CAUTION RADIOACTIVE—DEPLETED URANIUM" and "NOTIFY CIVIL AUTHORITIES [or COMPANY NAME] IF FOUND."

(d) Energy compensation source. Any licensee may use either an energy compensation source (ECS) contained within a logging tool or other tool components, if the ECS contains quantities of licensed material not exceeding 3.7 Mbq (100 microcuries).


(2) For well-logging applications without a surface casing protecting freshwater aquifers, use of the ECS shall be subject only to the requirements of K.A.R. 28-35-342 [p.336], K.A.R. 28-35-346
(e) Use of sealed source in a well without a surface casing. Any licensee may use a sealed source in a well without a surface casing for protecting freshwater aquifers if the licensee follows a procedure for reducing the probability that the source will become lodged in the well. This procedure shall be required to be approved by the U.S. nuclear regulatory commission or by an agreement state before the licensee uses the procedure.

(f) Use of a tritium neutron generator target source.

(1) Each licensee who uses a tritium neutron generator target source that contains a total quantity of tritium not exceeding 1,110 Mbq (30 curies) and is located in a well with a surface casing to protect freshwater aquifers shall be subject to the requirements of this part, excluding K.A.R. 28-35-349 [p.341] and K.A.R. 28-35-362 [p.350].

(2) Each licensee who uses a tritium neutron generator target source that contains a total quantity of tritium exceeding 1,110 Mbq (30 curies) or is located in a well without a surface casing to protect freshwater aquifers shall be subject to the requirements of this part, excluding K.A.R. 28-35-349 [p.341]. (Authorized by and implementing K.S.A. 48-1607; effective Sept. 20, 1993; amended Dec. 30, 2005.)

28-35-343. Storage precautions. (a) Each source of radiation, except accelerators, shall be provided with a storage container and, if transported, a transport container. The same container may be used in both cases if the container meets the requirements for each use. The container shall be provided with a lock to prevent unauthorized removal of, or exposure to, the source of radiation.

(b) Each source of radiation shall be stored in a manner that minimizes danger from explosion or fire. (Authorized by and implementing K.S.A. 48-1607; effective Sept. 20, 1993; amended Dec. 30, 2005; amended May 4, 2018.)

28-35-344. Transport precautions. Each licensee shall lock and physically secure each transport package containing licensed material in the transporting vehicle to prevent accidental
loss, tampering, or unauthorized removal of the licensed material from the vehicle. (Authorized by and implementing K.S.A. 48-1607; effective Sept. 20, 1993; amended May 4, 2018.)

**28-35-345. Radiation survey instruments.** (a) Each licensee or registrant shall maintain a sufficient supply of calibrated and operable radiation survey instruments capable of detecting beta and gamma radiation at each field station and temporary job site to make any physical radiation survey required by this part and part 4 of these regulations. Instrumentation shall be capable of measuring a range of 0.1 milliroentgens through at least 50 milliroentgens per hour.

(b) Each licensee shall have available additional calibrated and operable radiation-detection instruments sensitive enough to detect the low radiation and contamination levels that could be encountered if a sealed source ruptures. Any licensee may own the instruments or may have a procedure to obtain them from a second party when needed.

(c) Within the previous six months and after each servicing or repair, each radiation survey instrument used shall be calibrated as follows:

1. At energies and radiation levels appropriate for use;
2. with a demonstrated accuracy of within plus or minus 20 percent of the true radiation level on each scale; and
3. (A) At two points located approximately one-third and two-thirds of full scale on each scale if it is a linear instrument;
   (B) at midrange of each decade, and at two points of at least one decade if it is a logarithmic scale instrument; and
   (C) at appropriate points if it is a digital instrument.
4. A calibration record for each instrument shall be maintained for two years for inspection by the department. (Authorized by and implementing K.S.A 48-1607; effective Sept. 20, 1993; amended Dec. 30, 2005.)

**28-35-346. Leak testing of sealed sources.** (a) Requirements. Each licensee using any sealed source of radioactive material shall have the source tested for leakage as specified in subsection (c). A record of leak test results shall be kept in units of microcuries and maintained for inspection by the department.
licensee shall keep the records of the results for three years after the leak test is performed.

(b) Method of testing. Each test for leakage shall be performed only by a person specifically authorized to perform such a test by the department, the nuclear regulatory commission, an agreement state, or a licensing state. The test sample shall be taken from the surface of the source, the source holder, or the surface of the device in which the source is stored or mounted and on which one could expect contamination to accumulate. The test sample shall be analyzed for radioactive contamination. The analysis shall be capable of detecting the presence of 0.005 microcurie (185 Bq) of radioactive material on the test sample and shall be performed by a person specifically authorized to perform such a test by the department, the nuclear regulatory commission, an agreement state, or a licensing state.

(c) Interval of testing. Each sealed source of radioactive material, except an energy compensation source (ECS), shall be tested at intervals not to exceed six months. In the absence of a certificate from a transferor indicating that a test has been made within the six months before the transfer, the sealed source shall not be put into use until tested. If, for any reason, it is suspected that a sealed source could be leaking, the sealed source shall be removed from service immediately and tested for leakage as soon as practical. Each ECS that is not exempt from testing in accordance with subsection (e) shall be tested at intervals not to exceed three years. In the absence of a certificate from a transferor that a test has been made within the three years before the transfer, the ECS shall not be used until tested.

(d) Leaking or contaminated sources. If the test reveals the presence of 0.005 microcurie (185 Bq) or more of leakage or contamination, the licensee shall immediately withdraw the source from use and shall cause it to be decontaminated, repaired, or disposed of in accordance with these regulations. Each licensee shall check the equipment associated with the leaking source for radioactive contamination and, if contaminated, shall have the equipment decontaminated or disposed of by a nuclear regulatory commission licensee or an agreement state licensee that is authorized to perform these functions. A report describing the equipment involved, the test result, and the corrective action taken
shall be filed with the department within five days after receiving the test results.

(e) Exemptions. The following sources shall be exempt from the periodic leak test requirements of this regulation:

(1) Hydrogen-3 (tritium) sources;
(2) sources of radioactive material with a half-life of 30 days or less;
(3) sealed sources of radioactive material in gaseous form;
(4) sources of radioactive material emitting beta, beta-gamma, or gamma radiation, with an activity of not more than 100 microcuries (3.7 MBq); and
(5) sources of alpha-emitting radioactive material with an activity of not more than 10 microcuries (0.370 MBq). (Authorized by and implementing K.S.A 48-1607; effective Sept. 20, 1993; amended Dec. 30, 2005; amended March 18, 2011.)

28-35-347. In-person inventory. Each licensee or registrant shall conduct an in-person inventory to account for all sources of radiation once every six months. A record of each inventory shall be maintained for two years from the date of the inventory for inspection by the department and shall include the quantities and kinds of sources of radiation, the location where sources of radiation are assigned, the date of the inventory, and the name of the individual conducting the inventory. (Authorized by and implementing K.S.A. 48-1607; effective Sept. 20, 1993; amended May 4, 2018.)

28-35-348. Utilization records. Each licensee or registrant shall maintain current utilization records, which shall be kept available for inspection by the department for two years from the date of the recorded event, showing the following information for each source of radiation:

(a) make, model number, and a serial number or a description of each source of radiation used;
(b) the identity of the well-logging supervisor or field unit to whom assigned;
(c) each location where used and each date of use; and
(d) the radionuclide and activity used in a particular well, when dealing with tracer materials and radioactive markers.

28-35-349. Design, performance, and certification criteria for sealed sources used in downhole operations. (a) Each sealed source that is used in downhole operations and manufactured after May 1, 1991 shall be certified by the manufacturer or other testing organization to meet the following minimum criteria.

(1) Each source shall be doubly encapsulated.

(2) Each source shall contain radioactive material with a chemical and physical form that is as insoluble and nondispersive as practical.

(3) Each source's prototype shall have been tested and found to maintain its integrity after each of the following tests:

(A) Temperature. The test source shall be held at -40° C for 20 minutes and at 600° C for one hour. Then the test source be subjected to a thermal shock test with a temperature drop from 600° C to 20° C within 15 seconds.

(B) Impact test. A five-kg steel hammer with a diameter of 2.5 cm shall be dropped from a height of one meter onto the test source.

(C) Vibration test. The test source shall be subject to a vibration from 25 Hz to 500 Hz at five g (gravitational acceleration) amplitude for 30 minutes.

(D) Puncture test. A one-gram hammer with a pin having a diameter of 0.3 cm shall be dropped from a height of one meter onto the test source.

(E) Pressure test. The test source shall be subjected to an external pressure of 24,600 pounds per square inch absolute (1.695 x 10^7 pascal).

(b) No sealed source acquired after May 1, 1992 shall be put into use in the absence of a certificate from a transferor certifying that the sealed source meets the requirements of subsection (a), until the required determinations and testing have been performed.

(c) Each sealed source that is used in downhole operations after May 1, 1992 shall be certified by the manufacturer or other testing organization as meeting the sealed source performance requirements for oil well-logging contained in "sealed radioactive sources—classification," ANSI/HPS N43.6-1997, including the

(d) Certification documents shall be maintained for inspection by the department for a period of two years after source disposal. If the source is abandoned downhole, the certification documents shall be maintained until the department authorizes disposition of these documents.

(e) The requirements in subsections (a), (b), (c), and (d) shall not apply to any sealed sources that contain licensed material in gaseous form.

(f) The requirements in subsections (a), (b), (c), and (d) shall not apply to any energy compensation sources (ECS). Each ECS shall be registered with the department, NRC, or an agreement state.


28-35-350. Labeling. (a) Each source, source holder, and logging tool containing radioactive material shall bear a durable, legible, and clearly visible marking or label that has, at a minimum, the standard radiation caution symbol, without the conventional color requirement, and the following wording:

DANGER (or CAUTION)  
RADIOACTIVE MATERIAL

This labeling shall be on the smallest component transported as a separate piece of equipment.

(b) Each storage container that is transported shall have securely attached to the container a durable, legible, and clearly visible label that has, at a minimum, the standard radiation caution symbol and the following wording:

DANGER (or CAUTION)  
RADIOACTIVE MATERIAL  
NOTIFY CIVIL AUTHORITIES  
(or NAME OF COMPANY)

(c) No licensee may transport licensed material unless the material is packaged, labeled, marked, and accompanied by appropriate shipping papers in accordance with these regulations.
(Authorized by and implementing K.S.A. 48-1607; effective Sept. 20, 1993; amended Dec. 30, 2005.)

28-35-351. Repair, opening, or modification. (a) Each licensee shall visually check for defects all source holders, logging tools, sinker bars, injection tools, source handling tools, storage containers, transport containers, and uranium sinker bars before each use to ensure that the equipment is in good working condition and that the required labeling is present. If any defects are found, the equipment shall be removed from service until repaired, and a record shall be made listing the following:

(1) The date of inspection;
(2) the name of the inspector;
(3) the type of equipment involved;
(4) the defects found; and
(5) the repairs made.

(b) Each licensee shall have a program for semiannual visual inspections and routine maintenance of all source holders, logging tools, injection tools, source handling tools, storage containers, transport containers, and uranium sinker bars to ensure that the required labeling is legible and that no physical damage is visible. If any defects are found, the equipment shall be removed from service until repaired, and a record shall be made listing the following:

(1) The date of the inspection;
(2) the type of equipment involved;
(3) the inspection and maintenance operations performed;
(4) any defects found; and
(5) any actions taken to correct the defects.

(c) Removal of a sealed source holder or logging tool, and maintenance on sealed sources or holders in which sealed sources are contained shall not be performed by the licensee unless a written procedure to perform this operation that is approved by the U.S. nuclear regulatory commission, an agreement state, or a licensing state is used.

(d) If a sealed source is stuck in the source holder, the licensee shall not drill, cut, chisel, or perform any other operation on the source holder unless the licensee is approved by the U.S.
nuclear regulatory commission, an agreement state, or a licensing state to perform this operation.

(e) The repair, opening, or modification of any sealed source shall be performed only by a person authorized to do so by the department, the U.S. nuclear regulatory commission, an agreement state, or a licensing state.

(f) Each licensee shall maintain the records required by this regulation for three years. (Authorized by and implementing K.S.A. 48-1607; effective Sept. 20, 1993; amended Dec. 30, 2005.)

**28-35-352. Training requirements.** (a) A licensee or registrant shall not permit any individual to act as a logging supervisor as defined in this part until that individual meets the following requirements:

(1) Has received, in a course recognized by the department, the U.S. nuclear regulatory commission, an agreement state, or a licensing state, instruction in each subject outlined in K.A.R. 28-35-363 and has demonstrated an understanding of the course material and of this subsection by successfully completing a written or oral test;

(2) (A) has received copies of and received instruction in the regulations contained in this part and the applicable regulations in parts 1, 4, and 10 of these regulations, the conditions of the appropriate license or certificate of registration, and the licensee's or registrant's operating and emergency procedures; and

(B) has demonstrated an understanding of these materials; and

(3) has demonstrated competence to use sources of radiation, related handling tools, and radiation survey instruments that will be used on the job.

(b) No licensee may permit an individual to act as a logging assistant until that person meets the following:

(1) Has received instruction in the applicable regulations in parts 4, 10 and 11;

(2) has received copies of, and instruction in, the licensee's operating and emergency procedures;

(3) has demonstrated understanding of the materials listed in paragraphs (1) and (2) of this subsection by successfully completing a written or oral test; and
(4) has received instruction in the use of licensed materials, remote handling tools, and radiation survey instruments, as appropriate for the logging assistant's intended job responsibilities.

(c) Each licensee or registrant shall maintain training records for each employee for inspection by the department for three years following termination of employment. (Authorized by and implementing K.S.A 48-1607; effective Sept. 20, 1993; amended Dec. 30, 2005.)

28-35-353. Operating and emergency procedures. Each licensee shall develop and follow written operating and emergency procedures that cover the following:

(a) The handling and use of licensed materials, including the use of sealed sources in wells without surface casing for protecting freshwater aquifers, if appropriate;

(b) the use of remote handling tools for handling sealed sources and radioactive tracer material, except low-activity calibration sources;

(c) the methods and occasions for conducting radiation surveys, including surveys for detecting contamination;

(d) the ways to minimize personnel exposure, including exposures from inhalation and ingestion of licensed tracer materials;

(e) the methods and occasions for locking and securing stored licensed materials;

(f) personnel monitoring and the use of personnel-monitoring equipment;

(g) the transportation of licensed materials to field stations or temporary job sites, packaging of licensed materials for transport in vehicles, placarding of vehicles when needed, and physically securing licensed materials in transport vehicles during transportation to prevent accidental loss, tampering, or unauthorized removal;

(h) the procedures for picking up, receiving, and opening packages containing licensed materials;

(i) the use of tracers;

(j) decontamination of the environment, equipment, and personnel;

(k) the maintenance of records generated by logging personnel at temporary job sites;
(l) the inspection and maintenance of sealed sources, source holders, logging tools, injection tools, source handling tools, storage containers, transport containers, and uranium sinker bars;

(m) the actions to be taken if a sealed source is lodged in a well;

(n) the means of notifying the proper persons if an accident occurs; and

(o) the actions to be taken if a sealed source is ruptured, including actions to prevent the spread of contamination and minimize the inhalation and ingestion of licensed materials and actions to obtain appropriate radiation survey instruments as required by K.A.R. 28-35-345 [p.338]. (Authorized by and implementing K.S.A. 48-1607; effective Sept. 20, 1993; amended Dec. 30, 2005.)

28-35-354. Personnel monitoring. (a) The licensee or registrant shall not permit any individual to act as a logging supervisor or to assist in the handling of sources of radiation unless each individual wears a personnel-monitoring device as specified in K.A.R. 28-35-217a [p.210]. Each PMD shall be assigned to and worn by only one individual. Film badges shall be replaced at least monthly, and other personnel-monitoring devices shall be replaced at least quarterly. After replacement, each film badge or PMD shall be promptly processed.

(b) Each licensee shall provide bioassay services to individuals using licensed materials in subsurface tracer studies if required by the license.

(c) Personnel monitoring and bioassay results records shall be maintained for inspection until the secretary authorizes the disposition of these records. (Authorized by and implementing K.S.A. 48-1607; effective Sept. 20, 1993; amended Dec. 30, 2005.)

28-35-355. Security. (a) During each logging or tracer application, except when radiation sources are below ground or in shipping or storage containers, the logging supervisor or other designated employee shall maintain direct surveillance of the operation to protect against unauthorized or unnecessary entry into a controlled area.

(b) A logging supervisor shall be physically present at a temporary job site whenever licensed materials either are being
handled or are not stored and locked in a vehicle or storage place. The logging supervisor may leave the job site in order to obtain assistance if a source becomes lodged in a well. (Authorized by and implementing K.S.A 48-1607; effective Sept. 20, 1993; amended Dec. 30, 2005.)

28-35-356. Handling tools. Each licensee shall provide and require the use of tools that will assure remote handling of sealed sources other than low activity calibration sources. (Authorized by and implementing K.S.A. 1992 Supp. 48-1607; effective Sept. 20, 1993.)

28-35-357. Subsurface tracer studies. (a) Protective gloves and other appropriate protective clothing and equipment shall be used by all personnel when handling radioactive tracer material. Precautions shall be taken to avoid ingestion or inhalation of radioactive material and to avoid contamination of field stations and temporary job sites.

(b) A licensee shall not intentionally cause the injection of radioactive material into freshwater aquifers. (Authorized by and implementing K.S.A. 48-1607; effective Sept. 20, 1993; amended Dec. 30, 2005.)

28-35-358. Particle accelerators. A licensee or registrant shall not permit above-ground testing of any particle accelerator, designed for use in well logging which results in the production of radiation, except in areas or facilities controlled or shielded so that the requirements of K.A.R. 28-35-212a [p.192] and 28-35-214a [p.206] of these regulations, as applicable, are met. (Authorized by and implementing K.S.A. 1992 Supp. 48-1607; effective Sept. 20, 1993.)

28-35-359. Radiation surveys. (a) Each licensee shall make a radiation survey or calculation and record for each area where radioactive materials are stored.

(b) Each licensee shall make a radiation survey or calculation and record for the radiation levels in occupied positions and on the exterior of each vehicle used to transport radioactive
material. The survey or calculation shall include each source of radiation or combination of sources to be transported in the vehicle.

(c) After removal of the sealed source from the logging tool and before departing the job site, the logging tool detector shall be energized, or a survey meter used, to ensure that the logging tool is free of contamination.

(d) If the licensee has reason to believe that, as a result of any operation involving a sealed source, the encapsulation of the sealed source could be damaged by the operation, the licensee shall conduct radiation surveys, including a contamination survey, during and after the operation.

(e) The licensee shall make a radiation survey at the temporary job site before and after each subsurface tracer study to confirm the absence of contamination.

(f) Each licensee shall make a radiation survey and record at the job site or wellhead for each tracer operation, except those using hydrogen-3, carbon-14, and sulfur-35. The survey shall include measurements of radiation levels before and after the operation.

(g) Each record required by subsections (a) through (f) of this regulation shall include the dates, the identification of the individual or individuals making the survey, the identification of the survey instrument or instruments used, and an exact description of the location of the survey. The record of each licensee's survey shall be maintained for inspection by the department for three years after completion of the survey. (Authorized by and implementing K.S.A. 48-1607; effective Sept. 20, 1993; amended Dec. 30, 2005.)

28-35-359a. Radioactive contamination control. (a) If the licensee detects any evidence that a sealed source has ruptured or that licensed materials have caused any contamination, the licensee shall immediately initiate the emergency procedures required by this part.

(b) If contamination results from the use of licensed materials in well logging, the licensee shall decontaminate all work areas, equipment, and unrestricted areas.

(c) During all efforts to recover a sealed source lodged in a well, the licensee shall continuously monitor, with an appropriate radiation-detection instrument or a logging tool with a radiation detector, the circulating fluids from the well, if any, to check for contamination resulting from damage to the sealed source.
28-35-360. Documents and records required to be maintained at field stations. Each licensee or registrant shall maintain, for inspection by the department, the following documents and records for the specific devices and sources assigned to the field station:

(a) The appropriate license, certificate of registration, or equivalent document;
(b) operating and emergency procedures;
(c) applicable regulations;
(d) records of the latest survey instrument calibrations conducted according to K.A.R. 28-35-345 [p.338];
(e) records of the latest leak test results conducted according to K.A.R. 28-35-348 [p.340];
(f) quarterly physical inventories required by K.A.R. 28-35-359 [p.347];
(g) utilization records required by K.A.R. 28-35-348 [p.340];
(h) survey records required by K.A.R. 28-35-349 [p.341];
(i) records of inspection and maintenance required by K.A.R. 28-35-351 [p.343]; and
(j) training records required by K.A.R. 28-35-352 [p.344]

(Authorized by and implementing K.S.A. 48-1607; effective Dec. 30, 2005.)

28-35-361. Documents and records required at temporary jobsites. Each licensee or registrant conducting operations at a temporary jobsite shall have the following documents and records available at that site for inspection by the department:

(a) operating and emergency procedures;
(b) survey records required pursuant to K.A.R. 28-35-359 [p.347] for the period of operation at the site;
(c) evidence of current calibration for each radiation survey instrument in use at the site;

(Authorized by and implementing K.S.A. 48-1607; effective Sept. 20, 1993; amended Dec. 30, 2005.)
(d) when operating in the state under a reciprocity agreement, a copy of the appropriate license, certificate of registration, or equivalent documentation; and

(e) shipping papers for the transportation of radioactive material. (Authorized by and implementing K.S.A. 1992 Supp. 48-1607; effective Sept. 20, 1993.)


(b) Whenever a sealed source or device containing radioactive material is lodged downhole, the licensee shall monitor at the surface for the presence of radioactive contamination with a radiation survey instrument or logging tool during logging tool recovery operations.

(c) If the licensee knows or has reason to believe that a sealed source has been ruptured, the licensee shall notify the department immediately by telephone and subsequently, within 30 days, by confirmatory written report. This written report shall identify the well or other location, describe the magnitude and extent of the escape of radioactive material, assess the consequences of the rupture, and explain efforts planned or being taken to mitigate these consequences.

(d) If it becomes apparent that efforts to recover the radioactive source will not be successful, the licensee shall meet the following requirements:

1. The licensee shall advise the well operator of the following requirements regarding the method of abandonment:
   (A) The well operator shall immobilize and seal the radioactive source in place with a cement plug.
   (B) The well operator shall set in place a whipstock or other deflection device.
   (C) The well operator shall mount a permanent identification plaque at the surface of the well, containing the appropriate information required by this regulation.

2. The licensee shall notify the department by telephone, giving the circumstances of the loss, and request approval of the proposed abandonment procedures.
(3) The licensee shall file a written report with the department within 30 days of the abandonment, providing the following information:

(A) The date of occurrence and a brief description of attempts to recover the source;
(B) a description of the radioactive source involved, including the radionuclide, quantity, and chemical and physical form;
(C) a description of the surface location and identification of the well;
(D) the results of efforts to immobilize and set the source in place;
(E) the depth of the radioactive source;
(F) the depth of the top of the cement plug;
(G) the depth of the well; and
(H) the information contained on the permanent identification plaque.

(e) Whenever a sealed source containing radioactive material is abandoned downhole, the licensee shall provide a permanent plaque on the well or well-bore. The plaque shall meet the following requirements:

(1) Be constructed of long-lasting material, which may include stainless steel or Monel metal; and
(2) contain the following information engraved on its face:

(A) The word "CAUTION";
(B) the radiation symbol, without the conventional color requirement;
(C) the date of abandonment;
(D) the name of the well operator or well owner;
(E) the well name and the well identification number or numbers or other designation;
(F) a description of the sealed source or sources, by radionuclide and quantity of activity;
(G) the source depth and the depth to the top of the plug; and
(H) an appropriate warning that, depending on the specific circumstances of that abandonment, shall include one of the following:

(i) "Do not drill below plug back depth"
(ii) "do not enlarge casing"; or
(iii) "do not reenter the hole before contacting the Kansas department of health and environment radiation control program"; and

(3) be at least seven inches square. The word "CAUTION" shall be written in 1/2-inch letters and all other information shall be written in 1/4-inch letters.

(f) If the licensee knows or has reason to believe that radioactive material has been lost in or to an underground potable water source, the licensee shall immediately notify the department by telephone and subsequently, within 30 days, by confirmatory letter. The notice shall designate the well location and shall describe the magnitude and extent of loss of radioactive material, assess the consequences of the loss, and explain efforts planned or being taken to mitigate these consequences. (Authorized by and implementing K.S.A. 48-1607; effective Sept. 20, 1993; amended Nov. 1, 1996; amended May 4, 2018.)

28-35-363. Appendix A; training courses for logging supervisors; subjects. (a) Each training course for logging supervisors shall cover the fundamentals of radiation safety, including:

(1) characteristics of radiation;
(2) units of radiation dose and quantity of radioactivity; and
(3) significance of radiation dose, including:
   (A) radiation protection standards; and
   (B) biological effects of radiation dose;
(4) levels of radiation from sources of radiation;
(5) methods of minimizing radiation dose, including:
   (A) working time;
   (B) working distances; and
   (C) shielding; and
(6) radiation safety practices, including prevention of contamination and methods of decontamination.

(b) Each training course for logging supervisors shall cover radiation detection instrumentation to be used, including:

(1) use of radiation survey instruments, including training as to their:
   (A) operation;
   (B) calibration; and
   (C) limitations;
(2) survey techniques; and
(3) use of personnel monitoring equipment.
(c) Each training course for logging supervisors shall cover the equipment to be used, including:
   (1) handling equipment;
   (2) sources of radiation;
   (3) storage and control of equipment; and
   (4) operation and control of equipment.
(d) Each training course for logging supervisors shall include:
   (1) the requirements of pertinent federal and state regulations;
   (2) the licensee's or registrant's written operating and emergency procedures; and
   (3) the licensee's or registrant's record-keeping procedures.

Part 12. Licensure and Radiation Safety Requirements for Irradiators

28-35-375. General requirements. The provisions of 10 CFR part 36, as in effect on May 4, 2004, are hereby adopted by reference, with the changes specified in this regulation. (a) All reports required by this regulation shall be submitted to the department.

(b) The following sections shall be deleted:
   (1) 10 CFR 36.2, "definitions";
   (2) 10 CFR 36.5, "interpretations";
   (3) 10 CFR 36.8, "information collection requirements: OMB approval";
   (4) 10 CFR 36.11, "application for a specific license";
   (5) 10 CFR 36.91, "violations"; and
   (6) 10 CFR 36.93, "criminal penalties."

(c) Wherever the following CFR references occur within 10 CFR part 36, these references shall be replaced with the specified references to regulations and parts in this article:
   (1) "10 CFR part 19" shall be replaced with "part 10, 'instructions and reports to worker: inspections.'"
(2) "10 CFR 20.1501(c)" shall be replaced with "K.A.R. 28-35-217a [p.210], 'conditions requiring individual monitoring of external and internal occupational dose.'"

(3) "10 CFR 20.1902" shall be replaced with "K.A.R. 28-35-219a [p.212], 'caution signs and labels.'"

(4) "10 CFR 30.33 of this chapter" shall be replaced with "K.A.R. 28-35-180a [p.96], 'general requirements for the issuance of specific licenses.'"

(5) "10 CFR 30.35" shall be replaced with "K.A.R. 28-35-180b [p.98], 'financial assurance for decommissioning.'"

(6) "10 CFR 30.41" shall be replaced with "K.A.R. 28-35-190a [p.148], 'transfer of material.'"

(7) "10 CFR 30.50" shall be replaced with "K.A.R. 28-35-230a [p.241], 'reports of over-exposures and excessive levels and concentrations.'"

(8) "10 CFR 30.51" shall be replaced with "K.A.R. 28-35-137 [p.53], 'records.'"

(9) "10 CFR 170.31" shall be replaced with "K.A.R. 28-35-147a [p.61], 'schedule of fees.'"

(d) Wherever the following terms occur within 10 CFR part 36, these terms shall be replaced with "department":

(1) "Commission";

(2) "NRC operation center";

(3) "NRC regional office"; and (4) "NRC."

(e) The following changes shall be made to the sections specified:

(1) In 10 CFR 36.51, paragraph (a)(2) shall be replaced with the following text: "the requirements of part 10 and part 12 of these regulations that are relevant to the irradiator."

(2) In 10 CFR 36.57(d), the last sentence shall be replaced with the following sentence: "Radioactive concentrations shall not exceed those specified in 'appendices to part 4: standards for protection against radiation,' effective April 1994, table 2, column 2 or table 3 of appendix B, 'annual limits on intake (ALIs) and derived air concentrations (DACs) or radionuclides for occupational exposure; effluent concentrations; concentrations for release to sewerage.'"

(3) In 10 CFR 36.59(c), the last sentence shall be replaced with the following sentence: "If a pool is contaminated, the licensee shall arrange to clean the pool until the contamination levels do not
exceed the appropriate concentration in table 2, column 2 of 'appendices to part 4: standards for protection against radiation,' effective April 1994." (Authorized by and implementing K.S.A. 48-1607; effective Dec. 30, 2005.)


28-35-400. Applicability; additional requirements. (a) Each person licensed to receive, possess, own, acquire, use, process, store, transfer, or dispose of radioactive material shall be subject to this part.

(b) In addition to conforming to the licensing requirements in part 3 of these regulations and the requirements for protection in part 4 of these regulations, each licensee with any of the quantities of radioactive material specified in K.A.R. 28-35-411 shall be required to evaluate and prepare to respond to an event involving the possible release of radioactive material. This requirement shall include, at a minimum, immediate activities including containment, rescue, notification, and securing the scene of an event. (Authorized by K.S.A. 48-1607; implementing K.S.A. 48-1602; effective Dec. 30, 2005.)

28-35-401. Dose evaluation and contingency plan. Each person seeking a license to possess radioactive material in unsealed form, on a foil or plated source, or sealed in glass shall submit an application containing either of the following, if the radioactive material is in excess of any of the quantities specified in K.A.R. 28-35-411:

(a) An evaluation, as specified in K.A.R. 28-35-402, showing that the projected dose to a person off-site due to a release of radioactive material would not exceed 0.01 sievert (1 rem) total effective dose equivalent or 0.01 sievert (1 rem) to the thyroid; or

(b) a contingency plan, as prescribed in K.A.R. 28-35-403, for responding to any event in which radioactive material could be released from the site. (Authorized by K.S.A. 48-1607; implementing K.S.A. 48-1602; effective Dec. 30, 2005.)
28-35-402. Evaluation of potential dose. (a) For purposes of this part, the following terms shall have the meanings specified in this subsection.

(1) "Release fraction" means the ratio of the quantity of radioactive material released to the quantity of radioactive material available for release.

(2) "Respirable size range" means the range of sizes of airborne particles that can be deposited anywhere in the respiratory tract.

(b) In evaluating the total effective dose equivalent to an individual as specified in K.A.R. 28-35-401 [p.355], the applicant may take the following into account, as applicable:

(1) The radioactive material is physically separated so that only a portion could be involved in an alert, site area emergency, or general emergency.

(2) All or part of the radioactive material, because of the way the material is stored or packaged, is not subject to release during an alert, site area emergency, or general emergency.

(3) The release fraction in the respirable size range is predicted to be lower than the release fraction specified in K.A.R. 28-35-411 [p.362], due to the chemical or physical form of the material.

(4) The solubility in body fluids of the radioactive material is predicted to reduce the dose received.

(5) The facility design or engineered safety features in the facility are predicted to cause the release fraction to be lower than the release fraction specified in K.A.R. 28-35-411 [p.362].

(6) The operating restrictions or procedures are predicted to prevent any release fraction equal to or larger than that specified in K.A.R. 28-35-411 [p.362]. (Authorized by K.S.A. 48-1607; implementing K.S.A. 48-1602; effective Dec. 30, 2005.)

28-35-403. Contents of contingency plan. Each applicant or licensee shall ensure that the contingency plan that is submitted as specified in K.A.R. 28-35-401 [p.355] includes information about the following, in separate sections:

(a) The facility, including a brief description of the applicant's or licensee's facility and surroundings;

(b) the types of accidents that the contingency plan addresses, including an identification of each type of alert, site area
emergency, or general emergency involving radioactive material for which actions by applicant's or licensee's staff or off-site response organizations will be needed to protect members of the public;

(c) classification of accidents, consisting of a method for classifying and declaring each alert, site area emergency, or general emergency as defined in this part;

(d) detection of accidents, including the identification of the means for detecting each type of alert, site area emergency, or general emergency in a timely manner;

(e) mitigation of consequences, including a brief description of the means and equipment that are available for mitigating the consequences of each type of alert, site area emergency, or general emergency including the following:

(1) Means and equipment provided to protect workers on-site;

(2) a description of the program for maintaining the equipment;

(3) radiological exposure controls for on-site and off-site response personnel; and

(4) the readiness to carry out special efforts within any designated emergency planning zone;

(f) assessment of radioactive releases, including a brief description of the methods and equipment available to assess any releases of radioactive material;

(g) personnel responsibilities, including the following information:

(1) The names and titles of the applicant's or licensee's personnel responsible for developing, maintaining, and updating the contingency plan;

(2) a brief description of the responsibilities of the applicant's or licensee's personnel who will respond if an alert, site area emergency, or general emergency is declared, including identification of personnel responsible for promptly notifying off-site response organizations, which shall include the department; and

(3) a list of off-site response organizations, a description of their responsibilities and anticipated actions, and a copy of their formal commitments, if any;

(h) notification, coordination, and use of off-site response organizations, including the following information:
(1) A brief description of the means for promptly notifying the off-site response organizations specified in paragraph (g)(3) of this regulation if an alert, site area emergency, or general emergency occurs;

(2) a brief description of the arrangements made for requesting, and coordinating, and using off-site organizations capable of augmenting the planned on-site response, including arrangements for backup communications and 24-hour response capability. The types of assistance that could be requested may include medical treatment of contaminated or injured on-site workers;

(3) a description or drawing of designated locations from which control and assessment of an alert, site area emergency, or general emergency would be exercised; and

(4) provisions of notification and coordination if key personnel, parts of the facility, or any equipment is unavailable;

(i) information to be communicated, including the following information:

(1) A brief description of the information to be provided to off-site response organizations, which shall include the department, if an alert, site area emergency, or general emergency occurs. The types of information to be provided shall include the following:

(A) The declared status of the facility;

(B) a description of the actual or potential releases of radioactive material;

(C) the names and telephone numbers of personnel designated as points of contact;

(D) the population that has been affected; and

(E) any recommendations for protective action;

(2) a brief description of the types of information to be provided to the public by facility staff and through off-site response organizations; and

(3) if protective action by the public is part of the contingency plan, a description of how the public will be trained to perform the action;

(j) training, including the following information:

(1) A brief description of the performance objectives and plans for the initial and annual training that the applicant or licensee will provide to workers and responders about how to respond to an emergency, including any special instructions and orientation tours.
that the applicant or licensee will provide for fire, police, medical, and other emergency response personnel;

(2) provisions for familiarizing radiation workers and non-radiation workers, including off-site responders, with site-specific hazards and emergency procedures; and

(3) provisions for preparing site personnel for their responsibilities during an alert, site area emergency, or general emergency, including the use of drills, exercises and team training;

(k) drills and exercises, including specifications for the following:

   (1) Conducting quarterly communications checks with off-site response organizations that include the verification and updating of all necessary telephone numbers and other electronic communication addresses;

   (2) conducting at least one radiological and health physics, medical drill, or fire drill every two years and conducting, between the required biennial drills, at least one drill involving a combination of some of the principal functional areas of the applicant's or licensee's on-site emergency response capabilities;

   (3) inviting off-site response organizations to participate in on-site exercises conducted pursuant to K.A.R. 28-35-407 [p.360];

   (4) using several alert, site area emergency, or general emergency scenarios, including those involving many of the potential responders identified in the contingency plan and those postulated as most probable for the specific site, up to and including the maximum credible accident; and

   (5) ensuring that scenarios are not known in advance by the exercise participants whose roles are prescribed in the contingency plan; and

   (l) the criteria for determining when a safe condition exists, including a brief description of the site-specific criteria for a safe condition and the means of restoring the facility and surroundings to a safe condition after an alert, site area emergency, or general emergency. (Authorized by K.S.A. 48-1607; implementing K.S.A. 48-1602; effective Dec. 30, 2005.)

28-35-404. Comment from off-site response organizations. (a) Each applicant or licensee shall provide the contingency plan for comment to off-site response organizations
expected to respond in case of an alert, site area emergency, or general emergency including, at a minimum, local fire, ambulance, emergency management, and hospital emergency response officials. The applicant or licensee shall provide the contingency plan to these organizations at least 60 days before submitting the plan to the department. Each applicant or licensee shall submit any changes to the plan to off-site agencies for comment before resubmitting the plan to the department.

(b) Each applicant or licensee shall provide each comment received within the 60 days specified in subsection (a) to the department with the initial or amended contingency plan. The applicant or licensee shall also provide to the department any proposed response to the comment or comments. (Authorized by K.S.A. 48-1607; implementing K.S.A. 48-1602; effective Dec. 30, 2005.)


28-35-406. Training. Each licensee required to submit a contingency plan in accordance with K.A.R. 28-35-401 [p.355] shall provide training to facility staff and to personnel for each off-site response organization at least annually for each person who is responsible for responding to the types of accidents postulated in the contingency plan as most probable for the specific site. (Authorized by K.S.A. 48-1607; implementing K.S.A. 48-1602; effective Dec. 30, 2005.)

28-35-407. Conduct of drills and exercises. Each licensee that is required to submit a contingency plan in accordance with K.A.R. 28-35-401 [p.355] shall meet the following requirements:
(a) Conduct drills and exercises at least every two years to test the response to simulated emergencies;
(b) perform critiques of drills and exercises and ensure that these critiques evaluate the appropriateness of the contingency plan,
emergency procedures, facilities, equipment, training of personnel, and overall effectiveness of the response;

(c) unless the secretary approves otherwise, ensure that the critique of each exercise is performed by individuals who are not responsible for conducting the exercise; and

(d) correct any deficiencies noted in the critique of each drill and exercise within a time period for corrective action that is conveyed, in writing, to the department and approved by the secretary. (Authorized by K.S.A. 48-1607; implementing K.S.A. 48-1602; effective Dec. 30, 2005.)

28-35-408. Plan implementation. Each licensee required to submit a contingency plan in accordance with K.A.R. 28-35-401 [p.355] shall meet the following requirements:

(a) Comply with the contingency plan submitted to the department;

(b) notify all off-site response organizations, including the department, not later than one hour after the licensee declares an alert, site area emergency, or general emergency; and

(c) promptly report any projected dose and protective action recommendation as required by the contingency plan. (Authorized by K.S.A. 48-1607; implementing K.S.A. 48-1602; effective Dec. 30, 2005.)

28-35-409. Contingency plan revision. Each licensee that is required to submit a contingency plan pursuant to K.A.R. 28-35-401 [p.355] shall comply with the following:

(a) Update the contingency plan at least annually and provide the updated contingency plan to the department and to affected off-site response organizations within 30 days after the update is completed; and

(b) obtain the secretary's written approval before implementing any changes to the plan, except for updating individual names, titles, assignments of responsibility, and telephone numbers. All updates of individual names, titles, assignments of responsibility, and telephone numbers shall be reported to the department and to affected off-site response organizations within 30 days of these changes. (Authorized by
28-35-410. Documentation and recordkeeping. Each licensee required to submit a contingency plan pursuant to K.A.R. 28-35-401 [p.355] shall retain the following records in accordance with the recordkeeping requirements of part 3 of these regulations:

(a) The reports of contingency plan training, drills, and exercises as specified in K.A.R. 28-35-403 [p.356]; and

(b) the revisions and records of all notifications and reports as specified in K.A.R. 28-35-409 [p.361] and part 3 of these regulations. (Authorized by K.S.A. 48-1607; implementing K.S.A. 48-1602; effective Dec. 30, 2005.)

28-35-411. Table of quantities of radioactive material; need for contingency plan.

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<th>Radioactive Material(^1)</th>
<th>Release Fraction</th>
<th>Quantity (GBq)</th>
<th>Quantity (Ci)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actinium-228</td>
<td>0.001</td>
<td>148,000</td>
<td>4,000</td>
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<tr>
<td>Americium-241</td>
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<td>74</td>
<td>2</td>
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<tr>
<td>Americium-242</td>
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<td>74</td>
<td>2</td>
</tr>
<tr>
<td>Americium-243</td>
<td>0.001</td>
<td>74</td>
<td>2</td>
</tr>
<tr>
<td>Antimony-124</td>
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<td>4,000</td>
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<tr>
<td>Antimony-126</td>
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<td>Barium-133</td>
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<td>Barium-140</td>
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<td>Bismuth-207</td>
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<td>Bismuth-210</td>
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<td>Calcium-45</td>
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<td>20,000</td>
</tr>
<tr>
<td>Californium-252</td>
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<td>333</td>
<td>9 (20 mg)</td>
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<td>Carbon-14 (Non-CO)</td>
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<td>1,850,000</td>
<td>50,000</td>
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\(^1\) Referenced in the table.
<table>
<thead>
<tr>
<th>Radioactive Material¹</th>
<th>Release Fraction</th>
<th>Quantity (GBq)</th>
<th>Quantity (Ci)</th>
</tr>
</thead>
<tbody>
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<td>Cerium-141</td>
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<td>Cerium-144</td>
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<td>Cesium-134</td>
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<td>Cesium-137</td>
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<td>Cobalt-60</td>
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<td>Europium-152</td>
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<td>111,000</td>
<td>3,000</td>
</tr>
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<td>Gadolinium-153</td>
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<td>185,000</td>
<td>5,000</td>
</tr>
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<td>Gold-198</td>
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<td>1,110,000</td>
<td>30,000</td>
</tr>
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<td>Hafnium-172</td>
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<td>14,800</td>
<td>400</td>
</tr>
<tr>
<td>Hafnium-181</td>
<td>0.01</td>
<td>259,000</td>
<td>7,000</td>
</tr>
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<td>3,700</td>
<td>100</td>
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<td>Hydrogen-3</td>
<td>0.5</td>
<td>740,000</td>
<td>20,000</td>
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<tr>
<td>Indium-114m</td>
<td>0.01</td>
<td>37,000</td>
<td>1,000</td>
</tr>
<tr>
<td>Iodine-124</td>
<td>0.5</td>
<td>370</td>
<td>10</td>
</tr>
<tr>
<td>Iodine-125</td>
<td>0.5</td>
<td>370</td>
<td>10</td>
</tr>
<tr>
<td>Iodine-131</td>
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<td>370</td>
<td>10</td>
</tr>
<tr>
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<td>37,000</td>
<td>1,000</td>
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<td>Iridium-192</td>
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<td>40,000</td>
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<td>7,000</td>
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<td>1.0</td>
<td>222,000,000</td>
<td>6,000,000</td>
</tr>
<tr>
<td>Lead-210</td>
<td>0.01</td>
<td>296</td>
<td>8</td>
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<td>Manganese-56</td>
<td>0.01</td>
<td>2,220,000</td>
<td>60,000</td>
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<td>Mercury-203</td>
<td>0.01</td>
<td>370,000</td>
<td>10,000</td>
</tr>
<tr>
<td>Radioactive Material&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Release Fraction</td>
<td>Quantity (GBq)</td>
<td>Quantity (Ci)</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>------------------</td>
<td>----------------</td>
<td>----------------</td>
</tr>
<tr>
<td>Molybdenum-99</td>
<td>0.01</td>
<td>1,110,000</td>
<td>30,000</td>
</tr>
<tr>
<td>Neptunium-237</td>
<td>0.001</td>
<td>74</td>
<td>2</td>
</tr>
<tr>
<td>Nickel-63</td>
<td>0.01</td>
<td>740,000</td>
<td>20,000</td>
</tr>
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<td>Niobium-94</td>
<td>0.01</td>
<td>11,100</td>
<td>300</td>
</tr>
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<td>Phosphorus-32</td>
<td>0.5</td>
<td>3,700</td>
<td>100</td>
</tr>
<tr>
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<td>0.5</td>
<td>37,000</td>
<td>1,000</td>
</tr>
<tr>
<td>Polonium-210</td>
<td>0.01</td>
<td>370</td>
<td>10</td>
</tr>
<tr>
<td>Potassium-42</td>
<td>0.01</td>
<td>333,000</td>
<td>9,000</td>
</tr>
<tr>
<td>Promethium-145</td>
<td>0.01</td>
<td>148,000</td>
<td>4,000</td>
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<td>Promethium-147</td>
<td>0.01</td>
<td>148,000</td>
<td>4,000</td>
</tr>
<tr>
<td>Radium-226</td>
<td>0.001</td>
<td>3,700</td>
<td>100</td>
</tr>
<tr>
<td>Ruthenium-106</td>
<td>0.01</td>
<td>7,400</td>
<td>200</td>
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<tr>
<td>Samarium-151</td>
<td>0.01</td>
<td>148,000</td>
<td>4,000</td>
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<td>Scandium-46</td>
<td>0.01</td>
<td>111,000</td>
<td>3,000</td>
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<tr>
<td>Selenium-75</td>
<td>0.01</td>
<td>370,000</td>
<td>10,000</td>
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<tr>
<td>Silver-110m</td>
<td>0.01</td>
<td>37,000</td>
<td>1,000</td>
</tr>
<tr>
<td>Sodium-22</td>
<td>0.01</td>
<td>333,000</td>
<td>9,000</td>
</tr>
<tr>
<td>Sodium-24</td>
<td>0.01</td>
<td>370,000</td>
<td>10,000</td>
</tr>
<tr>
<td>Strontium-89</td>
<td>0.01</td>
<td>111,000</td>
<td>3,000</td>
</tr>
<tr>
<td>Strontium-90</td>
<td>0.01</td>
<td>3,330</td>
<td>90</td>
</tr>
<tr>
<td>Sulfur-35</td>
<td>0.5</td>
<td>3,330</td>
<td>900</td>
</tr>
<tr>
<td>Technetium-99</td>
<td>0.01</td>
<td>370,000</td>
<td>10,000</td>
</tr>
<tr>
<td>Technetium-99m</td>
<td>0.01</td>
<td>14,800,000</td>
<td>400,000</td>
</tr>
<tr>
<td>Tellurium-127m</td>
<td>0.01</td>
<td>185,000</td>
<td>5,000</td>
</tr>
<tr>
<td>Tellurium-129m</td>
<td>0.01</td>
<td>185,000</td>
<td>5,000</td>
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<tr>
<td>Terbium-160</td>
<td>0.01</td>
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<td>4,000</td>
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<td>Thulium-170</td>
<td>0.01</td>
<td>148,000</td>
<td>4,000</td>
</tr>
<tr>
<td>Tin-113</td>
<td>0.01</td>
<td>370,000</td>
<td>10,000</td>
</tr>
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<td>Tin-123</td>
<td>0.01</td>
<td>111,000</td>
<td>3,000</td>
</tr>
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<td>Tin-126</td>
<td>0.01</td>
<td>37,000</td>
<td>1,000</td>
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<tr>
<td>Titanium-44</td>
<td>0.01</td>
<td>3,700</td>
<td>100</td>
</tr>
<tr>
<td>Radioactive Material¹</td>
<td>Release Fraction</td>
<td>Quantity (GBq)</td>
<td>Quantity (Ci)</td>
</tr>
<tr>
<td>-----------------------</td>
<td>------------------</td>
<td>----------------</td>
<td>---------------</td>
</tr>
<tr>
<td>Vanadium-48</td>
<td>0.01</td>
<td>259,000</td>
<td>7,000</td>
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<td>Xenon-133</td>
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<td>33,300,000</td>
<td>900,000</td>
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<td>Yttrium-91</td>
<td>0.01</td>
<td>74,000</td>
<td>2,000</td>
</tr>
<tr>
<td>Zinc-65</td>
<td>0.01</td>
<td>185,000</td>
<td>5,000</td>
</tr>
<tr>
<td>Zirconium-93</td>
<td>0.01</td>
<td>14,800</td>
<td>400</td>
</tr>
<tr>
<td>Zirconium-95</td>
<td>0.01</td>
<td>185,000</td>
<td>5,000</td>
</tr>
<tr>
<td>Any other betagamma emitter</td>
<td>0.01</td>
<td>370,000</td>
<td>10,000</td>
</tr>
<tr>
<td>Mixed fission products</td>
<td>0.01</td>
<td>37,000</td>
<td>1,000</td>
</tr>
<tr>
<td>Contaminated equipment: beta-gamma emitters</td>
<td>0.001</td>
<td>370,000</td>
<td>10,000</td>
</tr>
<tr>
<td>Irradiated material, in any form other than solid noncombustible</td>
<td>0.01</td>
<td>370,000</td>
<td>10,000</td>
</tr>
<tr>
<td>Irradiated material that is solid and noncombustible</td>
<td>0.001</td>
<td>370,000</td>
<td>10,000</td>
</tr>
<tr>
<td>Mixed radioactive waste: beta-gamma emitters</td>
<td>0.01</td>
<td>37,000</td>
<td>1,000</td>
</tr>
<tr>
<td>Packaged mixed waste²: beta-gamma emitters</td>
<td>0.001</td>
<td>370,000</td>
<td>10,000</td>
</tr>
<tr>
<td>Any other alpha emitter</td>
<td>0.001</td>
<td>74</td>
<td>2</td>
</tr>
<tr>
<td>Contaminated equipment: alpha emitters</td>
<td>0.0001</td>
<td>740</td>
<td>20</td>
</tr>
</tbody>
</table>
Radioactive Material\(^1\) | Release Fraction | Quantity (GBq) | Quantity (Ci) \\
---|---|---|---
Packaged waste\(^2\): alpha emitters | 0.0001 | 740 | 20

\(^1\)For combinations of radioactive materials, the licensee shall be required to consider whether a contingency plan is needed if the sum of the ratios of the quantity of each radioactive material authorized to the quantity listed in this table for that material exceeds one.

\(^2\)Waste packaged in type B containers shall not require a contingency plan.


**Part 14. Therapeutic Radiation Machines**

**28-35-450. General requirements.** The provisions of "part X: therapeutic radiation machines" in volume 1 of the "suggested state regulations for control of radiation," including appendix A, published by the conference of radiation control program directors, inc. and dated February 2005, are hereby adopted by reference, with the changes specified in this regulation. (a) Sec. X.2, "definitions," shall be deleted.

(b) Sec. X.3(d)(vi) shall be deleted.

(c) Wherever the following phrases and references occur in part X, these phrases and references shall be replaced with the specified phrases and references to regulations and parts in this article:

1. "Agency" shall be replaced with "department."
2. "[INSERT EFFECTIVE DATE OF THESE REGULATIONS]" shall be replaced with "the effective date of these regulations."
3. "G.14" shall be replaced with "part 6."
4. The following phrases in part X shall be replaced with the phrase "part 4":
   1. In sec. X.3(i), "Parts D.1201, D.1205 and D.1502";
   2. in sec. X.4(a)(i)(1), "Part D.1201a.";
   3. in sec. X.4(a)(i)(2), "Parts D.1301a. and D.1301b";
   4. in sec. X.4(b), (b)(i), and (b)(iv), "Parts D.1301a. and D.1301b.";
(5) in sec. X.4(b)(iv), "Part D.1301c.";
(6) in sec. X.6(r)(vi), "Part D.1201";
(7) in sec. X.9(a), "Parts D.1201 and D.1301"; and
(8) in appendix A, sec. II(C), "Part D.1201."
(e) In sec. X.3(e), paragraph (i) shall be replaced with the following text: "Individuals operating a therapeutic radiation machine for healing arts purposes shall meet the requirements specified in the radiologic technologists practice act and shall have satisfactorily completed an education program in radiation therapy that meets the criteria specified in K.A.R. 100-73-3." (Authorized by and implementing K.S.A. 48-1607; effective Dec. 30, 2005; amended July 27, 2007.)

Part 15. Packaging and Transportation of Radioactive Material

28-35-500. General license: NRC-approved packages. (a) A general license shall be deemed to have been issued to any licensee to transport, or to deliver to a carrier for transport, any licensed or registered material in a package for which a license, certificate of compliance (CoC), or other approval has been issued by the NRC.

(b) Each general license specified in subsection (a) shall apply only to a licensee who has a quality assurance program approved by the NRC.

(c) Each general license specified in subsection (a) shall apply only to a licensee who meets the following requirements:

(1) Has a copy of the specific license, certificate of compliance, or other approval by the NRC for the package and has the drawings and any other documents referenced in the approval relating to the use and maintenance of the package and to the actions to be taken before shipment;

(2) complies with the terms and conditions of the license, certificate of compliance, or other approval, as applicable, and with the applicable requirements of this part; and

(3) has registered with the NRC before the licensee's first use of the package.

(d) Each general license specified in subsection (a) shall apply only if the package approval authorizes the use of the package under this general license.
(e) Each general licensee specified in subsection (a) shall meet the requirements of K.A.R. 28-35-501 [p.368] when using any type B or fissile material package approved by the NRC before April 1, 1996. (Authorized by and implementing K.S.A. 48-1607; effective Dec. 30, 2005.)

**28-35-501. Previously approved type B package.** (a)(1) Any type B package previously approved by the NRC but not designated as "B(U)," "B(M)," "B(U)F," or "B(M)F" in the identification number of the NRC CoC and any type AF package approved by the NRC before September 6, 1983 may be used under the general license specified in K.A.R. 28-35-500(a) [p.367], if the following additional provisions are met:

(A) The fabrication of the packaging was satisfactorily completed by August 31, 1986, as demonstrated by application of the model number on the package in accordance with 10 CFR 71.85(c).

(B) A serial number is assigned that is a unique identifier of each package that conforms to the approved design. The serial number shall be legibly and durably marked on the outside of each package.

(2) This subsection shall not apply to type B packages after October 1, 2008.

(b) Any type B(U) package, type B(M) package, or fissile material package may be used under the general license specified in K.A.R. 28-35-500(a) [p.367], if the following provisions are met:

(1) The package has been previously approved by the NRC and does not have the designation "-85" in the identification number of the NRC CoC.

(2) The fabrication of the package was satisfactorily completed on or before April 1, 1999, as demonstrated by the application of the model number on the package in accordance with 10 CFR 71.85(c).

(3) The package used for a shipment to a location outside the United States is subject to multilateral approval as defined in the U.S. DOT regulations specified in 49 CFR 173.403.

(4) A serial number is assigned that is a unique identifier of the package conforming to the approved design. The serial number shall be legibly and durably marked on the outside of the package.
28-35-502. **Air transport of plutonium.** (a) Notwithstanding any applicable provisions of any general licenses and notwithstanding any applicable exemptions stated in this part or in the U.S. department of transportation regulations, each licensee shall ensure that plutonium in any form, whether for import, export, or domestic shipment, is not transported by air or delivered to a carrier for air transport unless at least one of the following conditions is met:

1. The plutonium is contained in a medical device designed for human application for one individual.
2. The plutonium is contained in a material in which the specific activity is less than or equal to the activity concentration values for plutonium specified in K.A.R. 28-35-221b [p.224] and in which the radioactivity is essentially uniformly distributed.
3. The plutonium is shipped in a single package containing no more than an A2 quantity of plutonium in any isotope or form and is shipped as specified in K.A.R. 28-35-196a [p.162].
4. The plutonium is shipped in a package specifically authorized for the shipment of plutonium by air in the certificate of compliance issued by the NRC for that package.

(b) Nothing in subsection (a) of this regulation shall be interpreted as removing or diminishing the requirements of 10 CFR 73.24.

(c) For any shipment of plutonium by air that is subject to paragraph (a)(4), each licensee shall, through special arrangement with the carrier, require the carrier's compliance with 49 CFR 175.704. (Authorized by and implementing K.S.A. 48-1607; effective Dec. 30, 2005.)

28-35-503. **Package-opening instructions.** Before delivering any package containing licensed or registered material to a carrier for transport, each licensee shall ensure that any special instructions that are needed to safely open the package have been sent to, or otherwise have been made available to, the consignee for the consignee's use in accordance with K.A.R. 28-35-221a [p.224].
28-35-504. Advance notification of shipment of certain types of licensed or registered material. (a)(1) As specified in subsections (b), (c), and (d), each licensee shall provide advance notification to the governor or the governor's designee of each state of each shipment of licensed or registered material through or across the boundary of that governor's state. The licensee shall provide this advance notification before transporting, or delivering to a carrier for transport, any licensed or registered material outside the confines of the licensee's facility or other place of use or storage.

(2) As specified in subsections (b), (c), and (d), each licensee shall provide advance notification to the Indian tribal official or tribal official of participating tribes referenced in subsection (c), or the official's designee, of the shipment of licensed material within or across the boundary of the tribe's reservation before the transport or delivery to a carrier for transport of licensed material outside the confines of the licensee's plant or other place of use or storage.

(b)(1) The advance notification specified in subsection (a) shall be required for each shipment of irradiated reactor fuel containing 100 grams or less in net weight of irradiated fuel, exclusive of cladding and any other structural or packaging material, that has a total external radiation dose rate in excess of 100 rems per hour at a distance of three feet from any accessible surface without intervening shielding.

(2) The advance notification specified in subsection (a) shall also be required for each shipment of licensed or registered material, other than irradiated fuel, meeting all of the following conditions:

(A) The licensed or registered material is required to be shipped in a type B package for transportation as specified in this part.

(B) The licensed or registered material is being transported to or across a state boundary en route to a disposal facility or to a collection point for transport to a disposal facility.

(C) The quantity of licensed or registered material in a single package exceeds the smaller of the following:

(i) 3,000 times the $A_1$ value of the radionuclides as specified in 10 C.F.R. part 71, appendix A, which is adopted by reference in K.A.R. 28-35-221b [p.224], for special form radioactive material or
3,000 times the $A_2$ value of the radionuclides as specified in 10 C.F.R. part 71, appendix A, which is adopted by reference in K.A.R. 28-35-221b [p.224] for normal form radioactive material; and

(ii) 1,000 TBq (27,000 Ci).

(c) The notification specified in subsection (b) shall meet the following requirements:

(1) The notification shall be submitted, in writing, to the office of each appropriate governor or governor's designee and each appropriate Indian tribal official and to the director of the division of nuclear security in the office of nuclear security and incident response.

(2) Each notification delivered by mail shall be postmarked at least seven days before the beginning of the seven-day period during which departure of the shipment is estimated by the licensee to occur.

(3) Each notification delivered by any means other than mail shall reach the office of each governor or governor's designee and each appropriate Indian tribal official at least four days before the beginning of the seven-day period during which departure of the shipment is estimated by the licensee to occur.

(4) Each licensee shall retain a copy of the notification as a record for three years.

(d) Each advance notification of any shipment of irradiated reactor fuel or nuclear waste shall contain the following information:

(1) The name, address, and telephone number of the shipper, carrier, and receiver of the irradiated reactor fuel or nuclear waste shipment;

(2) a description of the irradiated reactor fuel or nuclear waste contained in the shipment, as specified in the regulations of the United States department of transportation (USDOT) in 49 C.F.R. 172.202 and 172.203(d);

(3) a shipment schedule, which shall include the following information:

(A) The point of origin of the shipment and a specification of the seven-day period during which departure of the shipment is estimated by the licensee to occur;
(B) a specification of the seven-day period during which arrival of the shipment at the state boundaries is estimated by the licensee to occur; and

(C) the destination of the shipment and a specification of the seven-day period during which arrival of the shipment at the destination is estimated by the licensee to occur; and

(4) the name of a contact person, including a telephone number, for current shipment information.

(e) If any licensee finds out that the shipment schedule previously furnished to any governor, governor's designee, or Indian tribal official in accordance with this regulation will not be met, that licensee shall perform the following:

(1) Telephone a responsible individual in the office of the governor or governor's designee or the Indian tribal official as soon as practical after the licensee has found out that the shipment schedule will not be met and inform that individual of the revised schedule; and

(2) maintain a record of the name of the responsible individual contacted and the date of this contact for three years.

(f) Each licensee who cancels an irradiated reactor fuel or nuclear waste shipment for which advance notification has been sent shall send a cancellation notice to the governor of each state or the governor's designee or to the Indian tribal official who was previously notified and to the director of the division of nuclear security in the office of nuclear security and incident response. The licensee shall state in the notice that the notice is a cancellation and shall identify the advance notification that is being canceled. The licensee shall retain a copy of the notice as a record for three years. (Authorized by and implementing K.S.A. 48-1607; effective Dec. 30, 2005; amended May 4, 2018.)

28-35-505. Quality assurance requirements. Each program for transport container inspection and maintenance that is limited to radiographic exposure devices, source changers, or any package transporting these devices or changers and that meets the requirements of K.A.R. 28-35-282a [p.299] or equivalent NRC or agreement state requirements shall be deemed to meet the requirement specified in K.A.R. 28-35-500(b) [p.367]. (Authorized by and implementing K.S.A. 48-1607; effective Dec. 30, 2005.)
Part 16. Radon

28-35-600. Definitions. In addition to the terms defined in K.S.A. 48-16a02 and amendments thereto, each of the following terms shall have the meaning assigned in this regulation:

(a) "All reasonable times" means normal business hours and other times that radon services are being performed, or at a time convenient for the property owner.

(b) "Mitigation" means any action taken to reduce radon concentrations in the indoor atmosphere or to prevent the entry of radon into the indoor atmosphere. This term shall include application of materials, installation of systems, and any new repair or alteration of a building or design.

(c) "Mitigation system" means any set of devices, controls, or materials installed for reducing radon concentrations in a building.

(d) "Quality assurance and quality control plan" means a plan or design that ensures the authenticity, integrity, reproducibility, and accuracy of radon concentration measurements. Each quality assurance and quality control plan shall include at a minimum procedures for the following:

(1) Chain of custody;
(2) calibration of measurement devices in the field;
(3) checks for background;
(4) duplicates, blanks, and spikes; and
(5) representative sampling.

(e) "Radon certification law" means K.S.A. 48-16a01 through 48-16a12, and amendments thereto.

(f) "Radon measurement technician" means an individual certified by the department who performs radon or radon progeny measurements for a radon measurement business or provides professional advice on radon or radon progeny measurements, health risks, radon-related exposure, radon entry routes, or other radon-related activities.

(g) "Radon mitigation technician" means an individual certified by the department who designs or installs radon mitigation systems or who performs and evaluates results of tests to determine appropriate radon mitigation systems. This individual may be employed or contracted by a radon mitigation business.
(h) "Radon progeny" means the short-lived radionuclides formed from the decay of radon-222 or radon-220.

(i) "Radon services" means any activity provided by a person that is subject to the radon certification law. This term shall include radon testing, the analysis of radon, radon testing or mitigation consultation, and radon mitigation.

(j) "Site" means a geographic location comprising leased or owned land, buildings, and other structures where radon services are performed. (Authorized by K.S.A. 2010 Supp. 48-16a03; implementing K.S.A. 2010 Supp. 48-16a03, 48-16a05, 48-16a06, and 48-16a08; effective Feb. 3, 2012.)


(a) Any initial or renewal application to conduct radon services may be denied by the department for any of the following reasons:

(1) Any false statement in the application;

(2) revocation of a prior radon services certification in Kansas or another state; or


(b) Any certification to conduct radon services may be suspended or revoked or may have requirements or restrictions added by the secretary for any of the following reasons:

(1) Any condition revealed by an application, any statement of fact, or any report, record, or inspection that could result in the denial of any application; or

(2) violation of or failure to observe any of the terms and conditions of the certification, any requirement of the radon certification law and K.A.R. 28-35-601 through 28-35-608 [p.374-p.380], or any order of the secretary.

(c) Initial certification and renewal certification shall be valid for 24 months.

(d) Requirements or restrictions that are necessary to ensure compliance with the radon certification law may be specified by the secretary at the time of initial certification or renewal certification or in connection with any radon services inspection.
(e) Failure to comply with all requirements for certification within 60 days of submittal of an application for initial or renewal certification shall void the application.

(f) An exemption to any requirement of K.A.R. 28-35-601 through 28-35-608 [p.374-p.380] may be granted by the secretary if both of the following conditions are met:

(1) A person certified to conduct radon services submits a written request, including justification for the exemption and any supporting data or documentation, to the secretary for review and consideration for approval.

(2) The secretary determines that the exemption is protective of public health, safety, and the environment.

(g) Each person certified under the radon certification law and these regulations shall submit the reports required by K.S.A. 48-16a10, and amendments thereto, and any additional relevant information requested by the department in a format specified by the department.

(h) All records required to be kept by each person certified under the radon certification law and these regulations shall be retained for at least three years.

(i) Each radon measurement technician, radon mitigation technician, radon measurement business, radon mitigation business, and radon measurement laboratory shall allow the department access at all reasonable times to that person's or that person's employer's facilities and files for inspection and examination of records of radon services to determine compliance with the radon certification law and K.A.R. 28-35-601 through 28-35-608 [p.374-p.380].

(j) Upon request by the department, each person certified under K.A.R. 28-35-601 through 28-35-608 [p.374-p.380] or the radon certification law shall submit a list of scheduled measurement or mitigation activities to the department within two business days of receipt of the request. (Authorized by K.S.A. 2010 Supp. 48-16a03 and 48-16a04; implementing K.S.A. 2010 Supp 48-16a03 and 48-16a10; effective Feb. 3, 2012.)

28-35-602. Fees. (a) Application fees for 24-month certification:
Each fee specified in this regulation shall be nonrefundable. (Authorized by and implementing K.S.A. 2010 Supp. 48-16a03 and 48-16a04; effective Feb. 3, 2012.)

28-35-603. Requirements for radon measurement technician. (a) Each applicant for initial certification as a radon measurement technician shall meet the requirements of K.S.A. 48-16a05, and amendments thereto, and the following additional requirements:

(1) Be at least 18 years of age;
(2) complete and show proof of completion to the department of a radon measurement training course with at least 16 hours of classroom instruction approved by the department pursuant to K.S.A. 48-16a05, and amendments thereto;
(3) pass a closed-book examination on radon measurement approved by the department pursuant to K.S.A. 48-16a05, and amendments thereto, with a score of at least 70 percent; and
(4) provide any additional relevant information requested by the department.

(b) Each radon measurement technician shall meet the following requirements:

(1) Conduct radon measurement activities in accordance with the requirements of the following:
   (A) K.S.A. 48-16a05, and amendments thereto;
   (B) "protocols for radon and radon decay product measurements in homes," EPA 402-R-92-003, including appendices, published by the environmental protection agency and dated June 1993, which is hereby adopted by reference;
   (C) "indoor radon and radon decay product measurement device protocols," EPA 402-R-92-004, published by the
environmental protection agency and dated July 1992, which is hereby adopted by reference; and

(D) all applicable municipal, county, state, and federal laws and regulations;

(2) upon request from the department, provide documentation of proficiency including continuing education requirements specified in K.A.R. 28-35-605 [p.378];

(3) notify the department of any name or address changes within 30 days; and

(4) maintain and adhere to a quality assurance and quality control plan. (Authorized by K.S.A. 2010 Supp. 48-16a03; implementing K.S.A. 2010 Supp. 48-16a03 and 48-16a05; effective Feb. 3, 2012.)

28-35-604. Requirements for radon mitigation technician. (a) Each applicant for initial certification as a radon mitigation technician shall meet the requirements of K.S.A. 48-16a06, and amendments thereto, and the following additional requirements:

(1) Be at least 18 years of age;

(2) complete and submit proof of completion to the department of a radon mitigation training course with at least 24 hours of classroom instruction that includes active participation in radon mitigation techniques approved by the department pursuant to K.S.A. 48-16a06, and amendments thereto;

(3) pass a closed-book examination on radon mitigation approved by the department pursuant to K.S.A. 48-16a06, and amendments thereto, with a score of at least 70 percent; and

(4) provide any additional relevant information requested by the department.

(b) Each radon mitigation technician shall meet the following requirements:

(1) Conduct radon mitigation activities in accordance with the requirements of the following:

(A) K.S.A. 48-16a06, and amendments thereto;

(B) "protocols for radon and radon decay product measurements in homes," which is adopted by reference in K.A.R. 28-35-603 [p.376];
(C) "indoor radon and radon decay product measurement device protocols," which is adopted by reference in K.A.R. 28-35-603 [p.376];

(D) "radon mitigation standards," EPA 402-R-93-078, including the appendix, published by the environmental protection agency, dated October 1993, and revised April 1994, which is adopted by reference; and

(E) municipal, county, state, and federal laws and regulations;

(2) upon request from the department, provide documentation of proficiency including continuing education requirements specified in K.A.R. 28-35-605 [p.378]; and

(3) notify the department of any name or address changes within 30 days. (Authorized by K.S.A. 2010 Supp. 48-16a03; implementing K.S.A. 2010 Supp. 48-16a03 and 48-16a06; effective Feb. 3, 2012.)

28-35-605. Continuing education. (a) Before certification renewal, each radon measurement technician shall meet the following continuing education requirements:

(1) Complete and submit proof of completion to the department of at least 16 hours of department-approved continuing education; and

(2) maintain documentation, pursuant to K.A.R. 28-35-601(h) [p.375], that the continuing education was successfully completed within the prior 24-month certification period.

(b) Before certification renewal, each radon mitigation technician shall meet the following continuing education requirements:

(1) Complete and submit proof of completion to the department of at least 24 hours of department-approved continuing education;

(2) maintain documentation, pursuant to K.A.R. 28-35-601(h) [p.375], that the continuing education was successfully completed within the prior 24-month certification period.

(c) If a person is certified as both a radon measurement technician and a radon mitigation technician, continuing education credit shall be granted for both certifications if the person completes at least 24 hours of department-approved continuing education
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credits for radon services during the 24-month period that the certificates are valid.

(d) Continuing education credit shall be accepted only for the completion of each different continuing education training course during a current certification period. Training courses for continuing education credit that are repeated shall be accepted only for the initial successful completion of the course during a current certification period. (Authorized by K.S.A. 2010 Supp. 48-16a03; implementing K.S.A. 2010 Supp. 48-16a03, 48-16a05, and 48-16a06; effective Feb. 3, 2012.)

28-35-606. Radon measurement business. (a) Each radon measurement business shall maintain for inspection a list of the name and credentials of each radon measurement technician employed or retained as a consultant by the radon measurement business.

(b) A radon measurement technician shall be present on-site to directly supervise all measurement activities performed by each radon measurement business.

(c) A radon measurement technician shall perform all testing and consultation about radon or radon progeny measurements, health risks, radon-related exposure, radon entry routes, and other radon-related activities for each radon measurement business. (Authorized by K.S.A. 2010 Supp. 48-16a03; implementing K.S.A. 2010 Supp. 48-16a03 and 48-16a07; effective Feb. 3, 2012.)

28-35-607. Radon mitigation business. (a) Each radon mitigation business shall maintain for inspection a list of the name and credentials of each radon mitigation technician employed or retained as a consultant by the radon mitigation business.

(b) All radon mitigation activities and consultations about radon or radon progeny measurements, health risks, radon-related exposure, radon entry routes, or other radon-related activities for a radon mitigation business shall be directly supervised or performed on-site by a radon mitigation technician.

28-35-608. Renewal of certification. (a) Each certification renewal application for a radon measurement technician, radon mitigation technician, or radon measurement laboratory shall be submitted at least 60 days before expiration of the certificate.

(b) Each applicant for renewal of certification shall meet the following requirements:

(1) Submit a completed application to the department on a form provided by the department;

(2) provide any additional relevant information requested by the department documenting that all applicable continuing education requirements for certification renewal have been completed; and

(3) submit payment to the department for the applicable fee specified in K.A.R. 28-35-602 [p.375].

(c) An applicant's failure to renew a certification within six months after certification has expired shall require that applicant's compliance with all requirements for initial certification.


Part 17. Physical Protection of Radioactive Material Quantities of Concern

28-35-700. General requirements. The provisions of 10 C.F.R. part 37, 78 fed. reg. 17007-17020 (2013), as in effect on May 20, 2013, are hereby adopted by reference, with the changes specified in this regulation.

(a) The following sections or portions of sections in 10 C.F.R. part 37 shall be deleted:

(1) 37.1;
(2) 37.3;
(3) 37.7;
(4) 37.9;
(5) 37.11(a) and (b);
(6) 37.13;
(7) 37.43(d)(9);
(8) in 37.81(g), the third sentence;
(9) 37.105;
(10) 37.107; and
(11) 37.109.

(b) In 10 C.F.R. 37.5, the following terms and the definition of each of these terms shall be deleted:
(1) "Act";
(2) "agreement state";
(3) "becquerel";
(4) "byproduct material";
(5) "commission";
(6) "curie";
(7) "government agency";
(8) "license";
(9) "lost or missing licensed material";
(10) "person";
(11) "state"; and
(12) "United States."

(c) Wherever the following words and phrases occur within the portions of 10 C.F.R. part 37 adopted in this regulation, these words and phrases shall be replaced with "department":
(1) "Appropriate NRC regional office listed in §30.6(a)(2) of this chapter";
(2) "Commission," except secs. 37.5, 37.27(a) and (c), 37.29(a) and 37.71;
(3) "NRC," except secs. 37.25(b)(2), 37.27(c), 37.29(a), and 37.71;
(4) "NRC regional office specified in §30.6 of this chapter";
(5) "NRC's Operations Center"; and
(6) "NRC's Operations Center (301-816-5100)."

(d) The following changes shall be made wherever the following text occurs within the portions of 10 C.F.R. part 37 adopted in this regulation:
(1) "Part 73 of this chapter" shall be replaced with "10 C.F.R. Part 73."
(2) "71.97(b) of this chapter" and "71.97 of this chapter" shall be replaced with "K.A.R 28-35-504(b)." [p.370]
(3) "Governor's designee" shall be replaced with "division of emergency management of the office of the adjutant general."

(Authorized by and implementing K.S.A. 48-1607; effective May 4, 2018.)
Kansas Statutes Annotated
Article 16 – Nuclear Energy Development and Radiation Control.

K.S.A. 48-1601. Declaration of policy; construction of act. It is the policy of the state of Kansas in furtherance of its responsibility to protect the public health and safety:

(a) To institute and maintain a program to permit development and utilization of sources of radiation for peaceful purposes consistent with the health and safety of the public;

(b) to institute and maintain a regulatory program for sources of radiation so as to provide for (1) compatibility with the standards and regulatory programs of the federal government; (2) an integrated, effective system of regulation within the state; and (3) a system consonant insofar as possible with those of other states; and

(c) to provide for the availability of capacity either within or outside the state for the disposal of low-level radioactive waste generated within the state, except for waste generated as a result of defense or federal research and development activities, and to recognize that such radioactive waste can be most safely and efficiently managed on a regional basis. Any state agency or institution acting as a grantee in a federal research or development program which generates low-level radioactive waste within the state shall be required to dispose of such waste in accordance with applicable state law.

The provisions of this act shall not be interpreted as limiting the intentional exposure of patients to radiation, for the purpose of diagnosis or therapy, by persons licensed to practice one or more of the healing arts within the authority granted to them by the Kansas healing arts statute, or by persons licensed to practice dentistry or podiatry within the authority granted to them by Kansas licensing laws applying to dentists and podiatrists.

History: L. 1963, ch. 290, § 1; L. 1972, ch. 207, §1; L. 1984, ch. 198, § 1; July 1.

K.S.A. 48-1602. Purposes. It is the purpose of this act to effectuate the policies set forth in K.S.A. 48-1601 by providing for:

(a) A program of effective regulation of sources of radiation for the protection of the public health and safety;
K.S.A. 48-1603 Radiation Control Program

(b) a program to promote an orderly regulatory pattern within the state, among the states and between the federal government and the state and facilitate intergovernmental cooperation with respect to use and regulation of sources of radiation to the end that duplication of regulation may be minimized;

(c) a program to establish procedures for assumption and performance of certain regulatory responsibilities with respect to by-product, source and special nuclear materials; radiation producing devices and electronic products; and

(d) a program to permit maximum utilization of sources of radiation consistent with the health and safety of the public.

History: L. 1963, ch. 290, § 2; L. 1972, ch. 207, §2; July 1.

K.S.A. 48-1603. Definitions. As used in this act:

(a) "By-product material" means: (1) Any radioactive material, except special nuclear material, yielded in or made radioactive by exposure to the radiation incident to the process of producing or utilizing special nuclear material;

(2) the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content;

(3) (A) any discrete source of radium-226 that is produced, extracted or converted after extraction for use for a commercial, medical or research activity; or

(B) any material that:

(i) Has been made radioactive by use of a particle accelerator; and

(ii) is produced, extracted or converted after extraction for use for a commercial, medical or research activity; or

(4) any discrete source of naturally occurring radioactive material, other than source material, that:

(A) The secretary declares by order would pose a threat to the public health and safety or the common defense and security similar to the threat posed by a discrete source of radium-226 after the United States nuclear regulatory commission, or any successor thereto, determines the same; and

(B) is extracted or converted after extraction for use in a commercial, medical or research activity.
(b) "Department" means the Kansas department of health and environment.

(c) "Civil penalty" means any monetary penalty levied on a licensee or registrant because of violations of statutes, regulations, licenses or registration certificates, but does not include criminal penalties.

(d) "Closure" or "site closure" means all activities performed at a waste disposal site, such as stabilization and contouring, to assure that the site is in a stable condition so that only minor custodial care, surveillance and monitoring are necessary at the site following termination of licensed operation.

(e) "Decommissioning" means final operational activities at a facility to dismantle site structures, to decontaminate site surfaces and remaining structures, to stabilize and contain residual radioactive material and to carry out any other activities to prepare the site for postoperational care.

(f) "Disposal of low-level radioactive waste" means the isolation of such waste from the biosphere.

(g) "Electronic product" means any manufactured or assembled: (1) Product which, when in operation, contains or acts as part of an electronic circuit and emits, or in the absence of effective shielding or other controls would emit, electronic product radiation; or (2) article which is intended for use as a component part, or accessory of a product described in this subsection and which in operation emits, or in the absence of effective shielding or other controls would emit, such radiation.

(h) "Electronic product radiation" means any ionizing or nonionizing, electromagnetic or particulate radiation, or any sonic, infrasonic, or ultrasonic wave, which is emitted from an electronic product as the result of the operation of an electronic circuit in such product.

(i) "General license" means a license effective pursuant to rules and regulations promulgated by the secretary of health and environment, without the filing of an application to transfer, acquire, own, possess or use quantities of, or devices or equipment utilizing by-product, source, special nuclear materials, or other radioactive material occurring naturally or produced artificially.

(j) "High-level radioactive waste" means: (1) Irradiated reactor fuel; (2) liquid wastes resulting from the operation of the first
cycle solvent extraction system, or equivalent, and the concentrated wastes from subsequent extraction cycles, or equivalent, in a facility for uranium processing irradiated reactor fuel; and (3) solids into which such liquid wastes have been converted.

(k) "Low-level radioactive waste" means radioactive waste not classified as:
(1) NORM waste or TENORM waste at concentrations and from sources established in rules and regulations adopted by the secretary on or before July 1, 2016;
(2) high-level radioactive waste;
(3) transuranic waste;
(4) spent nuclear fuel; or
(5) by-product material as defined in subsection (a)(2).

(l) "Person" means any individual, corporation, partnership, firm, association, trust, estate, public or private institution, group, agency, political subdivision of this state, or any other state or political subdivision or agency thereof, and any legal successor, representative, agency, or agency of the foregoing, other than the United States nuclear regulatory commission, or any successor thereto, and other than federal government agencies licensed by the United States nuclear regulatory commission, or any successor thereto.

(m) "Radiation" means: (1) Ionizing radiation including gamma rays, X-rays, alpha particles, beta particles, and including neutrons; (2) any electromagnetic radiation other than ionizing radiation which is generated during the operation of an electronic product; or (3) any sonic, ultrasonic, or infrasonic wave which is emitted from an electronic product as a result of the operation of an electronic circuit in such product.

(n) "Radioactive material" means any material, solid, liquid or gas, which emits ionizing radiation spontaneously. It includes accelerator produced, by-product, naturally occurring, source and special nuclear materials.

(o) "Secretary" means the secretary of the Kansas department of health and environment.

(p) "Source material" means: (1) Uranium, thorium or any other material which the secretary declares by order to be source material after the United States nuclear regulatory commission, or any successor thereto, has determined the material to be such; or (2) ores containing one or more of the foregoing materials, in such
concentration as the secretary declares by order to be source material after the United States nuclear regulatory commission, or any successor thereto, has determined the material in such concentration to be source material.

(q) "Source material mill tailings" means the tailings or waste produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content, including discrete surface wastes resulting from underground solution extraction processes but not including underground ore bodies depleted by such solution extraction process.

(r) "Source material milling" means any processing of ore, including underground solution extraction of unmined ore, primarily for the purpose of extracting or concentrating uranium or thorium therefrom and which results in the production of source material mill tailings.

(s) "Sources of radiation" means, collectively, radioactive material and radiation generating equipment.

(t) "Special nuclear material" means: (1) Plutonium, uranium 233, uranium enriched in the isotope 233 or in the isotope 235, and any other material which the secretary declares by order to be special nuclear material after the United States nuclear regulatory commission, or any successor thereto, has determined the material to be such, but does not include source material; or (2) any material artificially enriched by any of the foregoing, but does not include source material.

(u) "Specific license" means a license issued after application, to use, manufacture, produce, transfer, receive, acquire, own or possess quantities of, or devices or equipment utilizing by-product, source, special nuclear materials, or other radioactive material occurring naturally or produced artificially.

(v) "Spent nuclear fuel" means irradiated nuclear fuel that has undergone at least one year's decay since being used as a source of energy in a power reactor. Spent nuclear fuel includes the special nuclear material, by-product material, source material and other radioactive material associated with fuel assemblies.

(w) "Transuranic waste" means radioactive waste containing alpha emitting transuranic elements, with radioactive
half-lives greater than five years, in excess of 10 nanocuries per gram.

(x) "Naturally occurring radioactive material" or "NORM" means any nuclide that is radioactive in the nuclide's natural physical state. "NORM" does not include accelerator produced, by-product, source or special nuclear material.

(y) "NORM waste" means solid waste as defined in K.S.A. 65-3402, and amendments thereto, that is contaminated with NORM.

(z) "Technologically enhanced NORM" or "TENORM" means NORM whose radionuclide concentrations are increased by or as a result of past or present human practices. "TENORM" does not include accelerator produced, by-product, source or special nuclear material.

(aa) "TENORM waste" means solid waste as defined in K.S.A. 65-3402, and amendments thereto, that is contaminated with TENORM.


K.S.A. 48-1606. State radiation control; duties of secretary of health and environment; fees for licenses, registrations and services. (a) The secretary of health and environment shall be responsible for state radiation control.

(b) The secretary, for the protection of the public health and safety, shall develop programs for evaluation of hazards associated with use of sources of radiation.

(c) The secretary may:

(1) Advise, consult and cooperate with other agencies of the state, the federal government, other states and interstate agencies, political subdivisions and with groups concerned with control of sources of radiation;

(2) accept and administer grants or gifts, conditional or otherwise, in furtherance of its functions, from the federal government and from other sources, public or private;

(3) collect and disseminate information relating to control of sources of radiation;
(4) encourage, participate in, or conduct studies, investigations, training, research and demonstrations relating to control of sources of radiation;

(5) in accordance with the laws of the state, employ, compensate and prescribe the powers and duties of such individuals as may be necessary to carry out the responsibilities set forth herein;

(6) institute training programs for the purpose of qualifying personnel to carry out the provisions of this act, and make personnel available for participation in any program or programs of the federal government, other states or interstate agencies in furtherance of the purposes of this act;

(7) fix, charge and collect fees for licenses and registrations, and renewals thereof, issued under the nuclear energy development and radiation control act to cover all or any part of the cost of administering such act; and

(8) receive any moneys in the form of grants, gifts, licensing or registration fees, or as paid under an agreement with the secretary or as reimbursement for remedial action costs.

(d) Subject to the following limitations, the secretary may assess a fee for the following categories of radiation protection services:

Fee Category:
1. Special nuclear material
   A. Licenses for possession and use of special nuclear material in sealed sources contained in devices used in industrial measuring systems
      Maximum annual fee $950
   B. Any licenses not otherwise specified in this table for possession and use of special nuclear material, except licenses authorizing special nuclear material in unsealed form in combination that would constitute a critical mass
      Maximum annual fee $2,250
2. Source material
   A. Licenses that authorize only the possession, use and/or installation of source material for shielding
      Maximum annual fee $365
   B. All other source material licenses not otherwise specified in this table
      Maximum annual fee $5,700
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3. Radioactive or byproduct material
   A. Licenses of broad scope for possession and use of radioactive or byproduct material issued for processing or manufacturing of items containing radioactive or byproduct material for commercial distribution
      Maximum annual fee $10,900
   B. Other licenses for possession and use of radioactive or byproduct material issued for processing or manufacturing of items containing radioactive or byproduct material for commercial distribution
      Maximum annual fee $3,300
   C. Licenses authorizing the processing or manufacturing and distribution or redistribution of radiopharmaceuticals, generators, reagent kits and/or sources and devices containing radioactive or byproduct material. This category also includes the possession and use of source material for shielding when included on the same license
      Maximum annual fee $5,450
   D. Licenses and approvals authorizing distribution or redistribution of radiopharmaceuticals, generators, reagent kits and/or sources or devices not involving processing of radioactive or byproduct material. This category also includes the possession and use of source material for shielding when included on the same license
      Maximum annual fee $2,350
   E. Licenses for possession and use of radioactive or byproduct material in sealed sources for irradiation of materials in which the source is not removed from its shield (self-shielded units)
      Maximum annual fee $1,800
   F. Licenses for possession and use of less than 10,000 curies of radioactive or byproduct material in sealed sources for irradiation of materials in which the source is exposed for irradiation purposes. This category also includes underwater irradiators for irradiation of materials in which the source is not exposed for irradiation purposes
      Maximum annual fee $3,300
   G. Licenses for possession and use of 10,000 curies or more of radioactive or byproduct material in sealed sources for irradiation of materials in which the source is exposed for irradiation purposes. This category also includes underwater irradiators for irradiation of materials in which the source is not exposed for irradiation purposes
Maximum annual fee $12,050

H. Licenses issued to distribute items containing radioactive or byproduct material that require device review to persons exempt from licensing, except specific licenses authorizing redistribution of items that have been authorized for distribution to persons exempt from licensing

   Maximum annual fee $3,000

I. Licenses issued to distribute items containing radioactive or byproduct material or quantities of radioactive or byproduct material that do not require device review to persons exempt from licensing, except specific licenses authorizing redistribution of items that have been authorized for distribution to persons exempt from licensing

   Maximum annual fee $3,050

J. Licenses issued to distribute items containing radioactive or byproduct material that require sealed source and/or device review to persons generally licensed, except specific licenses authorizing redistribution of items that have been authorized for distribution to persons generally licensed

   Maximum annual fee $1,100

K. Licenses issued to distribute items containing radioactive or byproduct material or quantities of radioactive or byproduct material that do not require sealed source and/or device review to persons generally licensed, except specific licenses authorizing redistribution of items that have been authorized for distribution to persons generally licensed

   Maximum annual fee $700

L. Licenses of broad scope for possession and use of radioactive or byproduct material issued for research and development that do not authorize commercial distribution

   Maximum annual fee $5,900

M. Other licenses for possession and use of radioactive or byproduct material issued for research and development that do not authorize commercial distribution

   Maximum annual fee $2,800

N. Licenses that authorize services for other licensees, except (1) Licenses that authorize only calibration and/or leak testing services are subject to the fees specified in fee category 3P; and (2)
licenses that authorize waste disposal services are subject to the fees specified in fee categories 4A, 4B and 4C

O. Licenses for possession and use of radioactive or byproduct material for industrial radiography operations. This category also includes the possession and use of source material for shielding when authorized on the same license

Maximum annual fee $6,100

P. All other specific radioactive or byproduct material licenses not otherwise specified in this table

Maximum annual fee $1,250

Q. Registration of generally licensed devices or sources

Maximum annual fee $225

4. Waste disposal and processing

A. Licenses authorizing the possession and use of waste radioactive, by-product, source or special nuclear material for a commercial low-level radioactive waste disposal facility.

Maximum annual fee Full cost

i. Amendment to license concerning safety and environmental questions

Maximum amendment fee Full cost

ii. Amendment to license concerning administration questions (no safety or environment questions)

Maximum amendment fee Full cost

B. Licenses specifically authorizing the receipt of waste radioactive or byproduct material, source material or special nuclear material from other persons for the purpose of packaging or repackaging the material. The licensee will dispose of the material by transfer to another person authorized to receive or dispose of the material

Maximum annual fee $5,150

C. Licenses specifically authorizing the receipt of prepackaged waste radioactive or byproduct material, source material or special nuclear material from other persons. The licensee will dispose of the material by transfer to another person authorized to receive or dispose of the material

Maximum annual fee $3,700

5. Well logging

A. Licenses for possession and use of radioactive or byproduct material, source material and/or special nuclear material
for well logging, well surveys and tracer studies other than field flooding tracer studies
   Maximum annual fee $2,350
B. Licenses for possession and use of radioactive or byproduct material for field flooding tracer studies
   Maximum annual fee $2,350
6. Nuclear laundries
   A. Licenses for commercial collection and laundry of items contaminated with radioactive or byproduct material, source material or special nuclear material
   Maximum annual fee $11,550
7. Medical licenses
   A. Licenses issued for human use of radioactive or byproduct material, source material or special nuclear material in sealed sources contained in teletherapy devices. This category also includes the possession and use of source material for shielding when authorized on the same license
   Maximum annual fee $5,500
   B. Licenses of broad scope issued to medical institutions or two or more physicians authorizing research and development, including human use of radioactive or byproduct material except licenses for radioactive or byproduct material, source material or special nuclear material in sealed sources contained in teletherapy devices. This category also includes the possession and use of source material for shielding when authorized on the same license. Separate annual fees will not be assessed for pacemaker licenses issued to medical institutions who also hold nuclear medicine licenses under categories 7B or 7C
   Maximum annual fee $12,350
   C. Other license issued for human use of radioactive or byproduct material, source material and/or special nuclear material except licenses for radioactive or byproduct material, source material or special nuclear material in sealed sources contained in teletherapy devices. This category also includes the possession and use of source material for shielding when authorized on the same license. Separate annual fees will not be assessed for pacemaker licenses issued to medical institutions who also hold nuclear medicine licenses under categories 7B or 7C
   Maximum annual fee $2,300
8. Civil defense
   A. Licenses for possession and use of radioactive or byproduct material, source material or special nuclear material for civil defense activities
      Maximum annual fee $650

9. Device, product or sealed source safety evaluation
   A. Safety evaluation review of devices or products containing radioactive or byproduct material, source material or special nuclear material, except reactor fuel devices, for commercial distribution. This fee shall apply to each device or product
      Maximum annual fee $3,500
   
   B. Safety evaluation review of devices or products containing radioactive or byproduct material, source material or special nuclear material manufactured in accordance with the unique specifications of, and for use by, a single applicant, except reactor fuel devices. This fee shall apply to each device or product
      Maximum annual fee $3,500
   
   C. Safety evaluation of sealed sources containing radioactive or byproduct material, source material or special nuclear material, except reactor fuel, for commercial distribution. This fee shall apply to each device or product
      Maximum annual fee $1,100
   
   D. Registrations issued for the safety evaluation of sealed sources containing radioactive or byproduct material, source material or special nuclear material, manufactured in accordance with the unique specifications of, and for use by, a single applicant. This fee shall apply to each device or product
      Maximum annual fee $365

10. Special projects
    A. Hourly rate for radiation control program activities for which there is not an established fee category or for radiation protection services provided to nonlicensees and nonregistrants
       Maximum hourly rate $79

11. Reciprocity
    A. Licensees who conduct activities under a reciprocal agreement
       Maximum annual fee $750
    B. Registrants who conduct activities under a reciprocal agreement
       Maximum annual fee $200
12. X-ray machines
   A. Base registration fee per facility
      Maximum annual fee  $200
   B. Registration fee for each x-ray tube at a facility. This fee is in addition to the base registration fee
      Maximum annual fee per x-ray tube  $50

13. Accelerators
   A. Particle accelerators
      Maximum annual fee  $300

14. New license and registration applications
   A. New license and registration applications. Equal to annual fee of applicable category
      For licenses or registrations that authorize more than one activity, an annual fee shall be assessed for each of the applicable categories.

   (e)(1) An additional fee up to 50% of the maximum annual fee shall be assessed for each noncontiguous site where radioactive material is stored or used under the same license, per category.

   (2) As used in this subsection, "noncontiguous site" means a location more than one mile away from the main safety office where licensure records are maintained.

   (f) The secretary shall adopt rules and regulations fixing the fees for the radiation protection services provided under this act and shall periodically increase or decrease such fees consistent with the need to cover all or any part of the cost of administering such act.


K.S.A. 48-1607. Licensing, registration, possession and use of sources of radiation and records thereof. The secretary:

(a) Shall provide by rules and regulations for general or specific licensing of by-product, source, radioactive material and special nuclear materials, or devices or equipment utilizing such materials. Such rules and regulations shall provide for amendment, suspension or revocation of licenses;
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(b) shall develop programs, with due regard for compatibility with federal programs, for regulations and inspection of by-product, source and special nuclear materials;

(c) is authorized to require licensing or registration of all sources of radiation;

(d) shall prescribe rules and regulations pertaining to such sources of radiation;

(e) is authorized to exempt certain sources of radiation or kinds of uses or users from the licensing or registration requirements set forth in this section when the secretary makes a finding that the exemption of such sources of radiation or kinds of uses or users will not constitute a significant risk to the health and safety of the public;

(f) is authorized to provide for recognition of other state or federal licenses as the secretary may deem desirable, subject to such registration requirements as the secretary may prescribe;

(g) shall require each person who acquires, possesses or uses a source of radiation to maintain records relating to its receipt, storage, transfer or disposal and such other records as the secretary may require subject to such exemptions as may be provided by rules and regulations;

(h) shall require each person who acquires, possesses or uses a source of radiation to maintain appropriate records showing the radiation exposure of all individuals for whom personnel monitoring is required by rules and regulations of the secretary. Copies of these records and those required to be kept by subsection (g) of this section shall be submitted to the secretary on request. Any person possessing or using a source of radiation shall furnish to each employee, for whom personnel monitoring is required, a copy of such employee's personal exposure record annually, at any time such employee has received excessive exposure, and upon termination of employment;

(i) shall maintain a file of (1) all license applications, issuances, denials, amendments, transfers, renewals, modifications, suspensions, revocations, and any administrative or judicial action pertaining thereto; (2) registrants possessing sources of radiation requiring registration under the provisions of this act and any administrative or judicial action pertaining thereto; and (3) all rules and regulations relating to regulation of sources of radiation, pending or promulgated, and proceedings thereon.

**K.S.A. 48-1608. Administrative procedure and judicial review.** (a) In any proceeding under this act for the adoption or amendment of rules and regulations relating to control of sources of radiation or for granting, suspending, revoking or amending any license, the secretary shall afford an opportunity for a hearing on the record upon the written request of any person whose interest may be affected by the proceeding and shall admit any such person as a party to such proceeding.

In any proceeding for licensing ores processed primarily for their source material content and disposal of by-product material or source material mill tailings or for licensing disposal of low-level radioactive waste, the secretary shall provide an opportunity, after public notice, for written comments and a public hearing, and prior to any such proceeding the secretary shall prepare, for each licensed activity which has a significant impact on the human environment, a written analysis of the impact of such licensed activity on the environment. The analysis shall be available to the public before the commencement of any such hearing and shall include an assessment of the radiological and nonradiological impacts to the public health; an assessment of any impact on any waterway and groundwater; consideration of alternatives, including alternative sites and engineering methods, to the activities to be conducted and consideration of the long-term impacts, including decommissioning, decontamination and reclamation of facilities and sites associated with the licensed activities and management of any radioactive materials which will remain on the site after such decommissioning, decontamination and reclamation.

Hearings concerning a license under this act shall be in accordance with the provisions of the Kansas administrative procedure act. Procedure for other hearings authorized in this subsection shall be established by rule and regulation of the secretary.

(b) When the secretary, or any of the secretary's duly authorized agents, determines that there are reasonable grounds to believe a violation of the provisions of this act or of the rules and regulations of the secretary has occurred, the secretary shall
commence a hearing on the alleged violations or issue an order thereon subject to the right of the person to whom the order is directed to make written request for a hearing within 15 days after service of the order. If a hearing is requested, such hearing shall be held within 30 days after the receipt of the request for hearing, at such time and place as is designated by the secretary. The secretary shall make a determination as to whether the act or the rules and regulations of the secretary have been violated. Hearings under this subsection shall be in accordance with the provisions of the Kansas administrative procedure act.

(c) Whenever the secretary or the director of the division of environment of the department finds that an emergency exists requiring immediate action to protect the public health and safety, an emergency order may be issued in accordance with the provisions of K.S.A. 77-536, and amendments thereto. Any person aggrieved by the issuance of any such emergency order shall be entitled to a hearing in the same manner as is provided in subsection (b).

(d) Any action of the secretary upon a hearing pursuant to this section is subject to review in accordance with the Kansas judicial review act.


K.S.A. 48-1609. Inspection. The secretary or the secretary's authorized representatives shall have the power to enter at all reasonable times upon any private or public property for the purpose of determining whether or not there is compliance with or violation of the provisions of this act and rules and regulations issued hereunder, except that entry into areas under the jurisdiction of the federal government shall be effected only with the concurrence of the federal government or its duly designated representative.


K.S.A. 48-1610. Impounding of materials. The secretary shall have the authority to impound or order the impounding of sources of radiation, in the possession of any person who is not
equipped to observe or fails to observe the provisions of this act or any rules and regulations issued hereunder.


**K.S.A. 48-1611. Injunction proceedings.** Whenever, in the judgment of the secretary, any person has engaged in or is about to engage in any acts or practices which constitute or will constitute a violation of any provision of this act or any rule and regulation or order issued thereunder, the attorney general shall be empowered to make application to the district court of the county in which such acts or practices may be performed, for an order enjoining such acts or practices, or for an order directing compliance, and upon a showing by the secretary that such person has engaged or is about to engage in any such acts or practices, a permanent or temporary injunction, restraining order, or other order may be granted. If the attorney general shall present a verified application for a restraining order which alleges an immediate danger to the public health and safety, such restraining order shall issue forthwith.


**K.S.A. 48-1612. Prohibited uses.** It shall be unlawful for any person to use, manufacture, produce, transport, transfer, distribute, sell, install, repair, receive, acquire, own or possess any source of radiation unless licensed by or registered with the secretary in accordance with the provisions of this act.


**K.S.A. 48-1613. Penalties.** (a) Any person who violates any of the provisions of this act or rules and regulations issued pursuant to this act, or who violates any order of the secretary issued pursuant to this act, shall be guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine of not less than $25 nor more than $500 or by imprisonment not to exceed six months or by both such fine and imprisonment, and in addition thereto, may be enjoined from continuing such violation. Each day of such violation shall constitute a separate violation.
(b) Any person who violates any licensing or registration provision of this act, any rule and regulation or order issued thereunder or any term condition or limitation of any license or registration certificate issued thereunder or who commits any violation for which a license or registration certificate may be revoked under rules and regulations issued pursuant to this act may be subject to a penalty, to be imposed by the secretary, not to exceed $10,000. If any violation is a continuing one, each day of such violation shall constitute a separate violation for the purpose of computing the applicable civil penalty. The secretary shall have the power to compromise, mitigate or remit such penalties. Whenever the secretary proposes to subject a person to the imposition of a civil penalty under the provisions of this section the secretary shall follow the procedures contained in subsection (b) of K.S.A. 48-1608, and amendments thereto.

Any action by the secretary pursuant to this section is subject to review in accordance with the Kansas judicial review act.

(c) On the request of the secretary, the attorney general is authorized to institute a civil action to collect any penalty imposed pursuant to this section. The attorney general shall have the exclusive power to compromise, mitigate or remit such civil penalties as are referred for collection.

(d) All moneys collected from civil penalties shall be remitted to the state treasurer in accordance with the provisions of K.S.A. 75-4215, and amendments thereto. Upon receipt of each such remittance, the state treasurer shall deposit the entire amount in the state treasury to the credit of the state general fund. Moneys collected from civil penalties shall not be used for normal operating expenses of the department except as appropriations are made from the general fund in the normal budgetary process.


K.S.A. 48-1614. Trade secrets and industrial processes protected. Any report of investigation or inspection, or any information which is a trade secret under the uniform trade secrets act (K.S.A. 60-3320 et seq. and amendments thereto) or secret industrial processes obtained by a department or agency from any person in carrying out their responsibilities under this act shall not
be disclosed or opened to public inspection except as may be necessary for the performance of the functions of such department or agency. It is the affirmative duty of such person to inform such department or agency of their claim to a trade secret or secret industrial process.


K.S.A. 48-1615. Inspection agreements. The secretary is authorized to enter into, subject to the approval of the governor, an agreement or agreements with the federal government, other states or interstate agencies, whereby this state will perform on a cooperative basis with the federal government, other states or interstate agencies, inspections or other functions relating to control of sources of radiation.


K.S.A. 48-1616. Federal-state agreements. (a) The governor, on behalf of this state, is authorized to enter into agreements with the federal government providing for discontinuance of certain of the federal government's responsibilities with respect to sources of radiation and the assumption thereof by this state.

(b) Any person who, on the effective date of an agreement under subsection (a) above, possesses a license issued by the federal government shall be deemed to possess the same pursuant to a license issued under this act, which shall expire either ninety (90) days after receipt from the secretary of health and environment of a notice of expiration of such license, or on the date of expiration specified in the federal license, whichever is earlier.


K.S.A. 48-1617. Effect of act on local ordinances, resolutions and regulations. Ordinances, resolutions, or regulations, now or hereafter in effect, of the governing body of a municipality or county or board of health relating to by-product, source and special nuclear materials, radiation producing devices
and electronic products shall not be superseded by this act:
Provided, That such ordinances or regulations are and continue to
be consistent with the provisions of this act, amendments thereto
and rules and regulations hereunder.


**K.S.A. 48-1618. Invalidity of part.** If any section,
subsection, sentence, clause, phrase, or word of this act is for any
reason held to be unconstitutional, such decree shall not affect the
validity of any remaining portion of this act.

History:  L. 1963, ch. 290, § 18; July 1.

**K.S.A. 48-1619. Title of act; citation.** This act shall be
known and may be cited as the "nuclear energy development and
radiation control act."


**K.S.A. 48-1620. Licensing of low-level radioactive
waste disposal facility required; conditions.** The secretary shall
review and grant or deny final approval for each low-level
radioactive waste disposal facility license in the same manner as
provided in K.S.A. 65-3433 et seq., and amendments thereto. The
secretary shall not approve any such license which would permit the
disposal of low-level radioactive waste below the natural level of
the disposal site unless the secretary, subject to legislative approval,
has determined that below grade disposal provides greater
protection than above grade disposal for the environment and public
health for the period of time for which such low-level radioactive
waste may continue to pose a hazard to the environment and public
health.

History:  L. 1984, ch. 198, § 13; L. 1987, ch. 202, § 1; L.
2015, ch. 35, § 2; July 1.

**K.S.A. 48-1621. Terms and conditions of licenses;
transfer of title to state, when.** (a) Any radioactive materials
license issued or renewed after the effective date of this act for any
activity which results in the production of by-product material or
source material mill tailings shall contain such terms and conditions
as the secretary determines to be necessary to assure that, prior to termination of such license:

(1) The licensee will comply with decontamination, decommissioning and reclamation standards prescribed by the secretary which shall be equivalent, to the extent practicable, or more stringent than those of the United States nuclear regulatory commission for sites: (A) At which ores were processed primarily for their source material content; and (B) at which such by-product material or mill tailings are deposited; and

(2) ownership of any disposal site and such by-product material or mill tailings which resulted from the licensed activity shall, subject to the provisions of subsection (b), be transferred to: (A) The United States; or (B) the state, if the state exercises the option to acquire land used for the disposal of such by-product material or mill tailings. Any license which is in effect on the effective date of this act and which is subsequently terminated without renewal shall comply with paragraphs (1) and (2) of this subsection (a) upon termination.

(b) (1) The secretary shall require by rule and regulation, or order that, prior to the termination of any license which is issued after the effective date of this act, title to the land, including any interests therein, other than land held in trust by the United States for any Indian tribe or owned by an Indian tribe subject to a restriction against alienation imposed by the United States or land already owned by the United States or by the state, which is used pursuant to such license for the disposal of by-product material or source material tailings shall be transferred to: (A) The United States; or (B) the state, unless the United States nuclear regulatory commission determines prior to such termination that transfer of title to such land and such by-product material or mill tailings is not necessary or desirable to protect the public health, safety or welfare or to minimize danger to life or property.

(2) If transfer to the state of title to such by-product material or mill tailings and land is required, the secretary shall, following the United States nuclear regulatory commission's determination that the licensee has complied with applicable standards and requirements under the license, assume title to such by-product material or mill tailings and land and maintain such by-
product and mill tailings and land in such manner as will protect the public health and safety and the environment.

(3) The secretary is authorized to undertake such monitoring, maintenance and emergency measures as are necessary to protect the public health and safety for those materials and property for which custody has been assumed pursuant to this act.

(4) The transfer of title to land or by-product materials or source material mill tailings to the United States or the state shall not relieve any licensee of liability for any fraudulent or negligent acts done prior to such transfer.

(5) By-product material and mill tailings and land transferred to the United States or the state in accordance with this subsection: (A) Shall be transferred without cost to the United States or the state other than administrative and legal costs incurred by the United States or the state in carrying out such transfer; or (B) in licensing and regulation of by-product material and source material tailings or of any activity which results in the production of by-product material and such tailings, the secretary shall require compliance with applicable standards promulgated by the secretary which are equivalent, to the extent practicable, or more stringent than, standards adopted and enforced by the United States nuclear regulatory commission for the same purpose, including requirements and standards promulgated by the United States environmental protection agency.

History: L. 1984, ch. 198, § 14; July 1.

K.S.A. 48-1622. Compact negotiations authorized; site acquisitions; contracts for operation of site. (a) The secretary is authorized to enter into negotiations for a compact with other states for the establishment and operation of a regional low-level radioactive waste disposal site which, before being put into effect, shall be ratified by the legislatures of three states and consented to by the Congress of the United States.

(b) The state is authorized to accept or acquire, by gift, transfer or purchase, from another governmental agency or private person, suitable sites including land and appurtenances for the disposal of low-level radioactive waste. Sites received by gift or transfer are subject to approval and acceptance by the legislature.

(c) Lands and appurtenances which are used for the disposal of low-level radioactive waste shall be acquired in fee
simple absolute and used exclusively for such purpose, unless or until the secretary determines that such exclusive use is not required to protect the public health, safety, welfare or environment. Before such site is leased for other use, the secretary shall require and assure that the radioactive waste history of the site be recorded in the permanent land records of the site. All radioactive material accepted by the site operator or by any agent of the site operator for disposal on a radioactive waste disposal site shall become the property of the state.

(d) The state is authorized to arrange for the availability of a service for disposal of low-level radioactive waste by contract operation of a disposal site acquired pursuant to subsection (b) or already owned by the state. A contract operator shall be subject to the surety and long-term care funding provisions of this act and to appropriate licensing by the United States nuclear regulatory commission or by the secretary under K.S.A. 48-1607, and amendments thereto.

(e) The secretary shall not approve any application for a license to receive radioactive waste from other persons for disposal on land not owned by the state or federal government.


K.S.A. 48-1623. Surety requirements to meet license requirements; radiation site closure and reclamation fund established; funding arrangements for long-term care; radiation long-term care fund established; contracts for care and decommissioning services. (a) For licensed activities involving source material milling, source material mill tailings and disposal of low-level radioactive waste, the secretary shall, and for other classes of licensed activity involving low-level radioactive material, the secretary may establish by rule and regulation standards and procedures to ensure that the licensee will provide an adequate surety or other financial arrangement to permit the completion of all requirements established by the secretary for the decontamination, closure, decommissioning and reclamation of site, structures and equipment used in conjunction with such licensed activity, in case the licensee should default for any reason in performing such requirements.
(b) All sureties required pursuant to subsection (a) which are forfeited shall be paid to the secretary, who shall remit such moneys to the state treasurer in accordance with the provisions of K.S.A. 75-4215, and amendments thereto. Upon receipt of each such remittance, the state treasurer shall deposit the entire amount in the state treasury to the credit of a special fund called the radiation site closure and reclamation fund which is hereby established. All moneys in this fund are hereby appropriated and may be expended by the secretary as necessary to complete such requirements on which licensees have defaulted. Moneys in this fund shall not be used for normal operating expenses of the secretary or the department.

(c) For license activities involving the disposal of source material, mill tailings and disposal of low-level radioactive waste, the secretary shall, and for other classes of licensed activity when low-level radioactive material which will require surveillance or care is likely to remain at the site after the licensed activities cease the secretary may, establish by rule and regulation standards and procedures to ensure that the licensee, before termination of the license, will make available such funding arrangements as may be necessary to provide for long-term site surveillance and care.

(d) All funds collected from licensees pursuant to subsection (c) shall be paid to the secretary who shall remit such funds to the state treasurer in accordance with the provisions of K.S.A. 75-4215, and amendments thereto. Upon receipt of each such remittance, the state treasurer shall deposit the entire amount in the state treasury to the credit of a special fund called the radiation long-term care fund which is hereby established. All funds accrued as interest on moneys deposited in this fund are hereby appropriated and may be expended by the secretary for continuing long-term surveillance maintenance and other care of facilities from which such funds are collected as necessary for protection of the public health, safety and environment. Notwithstanding any other provision of this subsection, if title to and custody of any radioactive material and its disposal site are transferred to the United States upon termination of any license for which funds have been collected for such long-term care, the collected funds and interest accrued thereon shall be transferred to the United States.

(e) The sureties or other financial arrangement and funds required by subsections (a) and (b) shall be established in amounts
sufficient to ensure compliance with those standards, if any, established by the United States nuclear regulatory commission pertaining to decontamination, closure, decommissioning, reclamation and long-term site surveillance and care of such facilities and sites.

(f) In order to provide for the proper care and surveillance of sites subject to subsection (c) of this section which are not subject to K.S.A. 48-1620 or 48-1621, and amendments thereto, the state may acquire by gift or transfer from other governmental agencies or private persons, any land and appurtenances necessary to fulfill the purposes of this section. Any such gift or transfer is subject to approval and acceptance by the state legislature.

(g) The secretary may provide by contract, agreement, lease or license with any person, including another state agency, for the decontamination, closure, decommissioning, reclamation, surveillance or other care of a site subject to this section as needed to carry out the purposes of this section.

(h) In the event a person licensed by any governmental agency, other than the secretary, desires to transfer a site to the state for the purpose of administering or providing long-term care, a lump sum deposit shall be made to the radiation long-term care fund. The amount of such deposit shall be determined by the secretary taking into account the factors stated in subsections (c) and (e) of this section.

(i) All state, local or other governmental agencies, shall be exempt from the requirements of subsections (a) and (c).


K.S.A. 48-1624. Inspection agreements; training programs. (a) The secretary is authorized to enter into an agreement or agreements with the United States nuclear regulatory commission pursuant to section 274(c) of the atomic energy act of 1954, as amended, other federal agencies, as authorized by law, other states or interstate agencies, whereby this state will perform on a cooperative basis with the commission, other federal governmental agencies, other state or interstate agencies, inspections or other functions relating to control of sources of radiation.
(b) The secretary may institute training programs for the purpose of qualifying personnel to carry out the provisions of this act, and may make such personnel available for participation in any program or programs of the federal government, other states or interstate agencies in furtherance of the purposes of this act.

History: L. 1984, ch. 198, § 17; July 1.

K.S.A. 48-1625. Radiation control operations fee fund created; expenditures. (a) There is hereby created in the state treasury the radiation control operations fee fund to administer the provisions of K.S.A. 48-1601 through 48-1624, and amendments thereto. Such fund shall be administered by the secretary of health and environment in accordance with the provisions of this section.

(b) Revenue from the following sources shall be deposited in the state treasury and credited to the radiation control operations fee fund:

1. Fees collected for licenses and registrations, and renewals thereof, issued under the nuclear energy development and radiation control act;
2. Reimbursement for administrative, inspection, radioactive material disposal, investigation and remedial action expenses;
3. Excluding civil penalties, moneys paid pursuant to any agreement, stipulation or settlement;
4. Grants, gifts, bequests or state appropriations for the purposes of K.S.A. 48-1601 through 48-1624, and amendments thereto;
5. Fees collected pursuant to K.S.A. 2019 Supp. 48-16a04, and amendments thereto; and
6. Interest attributable to investment of moneys in the fund.

Moneys described in this subsection which are received by the secretary shall be remitted by the secretary to the state treasurer in accordance with the provisions of K.S.A. 75-4215, and amendments thereto. Upon receipt of each such remittance the state treasurer shall deposit the entire amount in the state treasury to the credit of such fund.

The secretary of health and environment is authorized to receive from the federal government or any of its agencies or from any private or governmental source any funds made available for the
purposes of K.S.A. 48-1601 through 48-1624, and amendments thereto.

(c) The secretary is authorized to use moneys from the radiation control operations fee fund to pay the cost of:

(1) All activities related to licensing and registration, including, but not limited to, development and issuance of licenses, registrations and renewals thereof, compliance monitoring, inspections, long term monitoring and enforcement actions and decontamination, decommissioning, reclamation or remedial actions;

(2) design and review of radioactive waste disposal facilities;

(3) review and witnessing of test and repair procedures;

(4) investigation of violations, complaints, pollution and events affecting the environment or public health;

(5) design and review of remedial action plans;

(6) personnel training programs;

(7) contracting for services needed to supplement the department's staff expertise in administering the provisions of K.S.A. 48-1601 through 48-1624, and amendments thereto;

(8) staff consultation needed to provide radiation protection services provided under this act;

(9) mitigation of adverse environmental or public health impacts, including impounding sources of radiation;

(10) emergency or long-term remedial activities;

(11) administrative, technical and legal costs incurred by the secretary in administering the provisions of K.S.A. 48-1601 through 48-1624, and amendments thereto; and

(12) costs of program administration, including the state's share of any grant received from the federal government or from other sources, public or private.

(d) On or before the 10th of each month, the director of accounts and reports shall transfer from the state general fund to the radiation control operations fee fund interest earnings based on:

(1) The average daily balance of moneys in the radiation control operations fee fund for the preceding month; and

(2) the net earnings rate of the pooled money investment portfolio for the preceding months.
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(e) All expenditures from this fund shall be made in accordance with appropriation acts and upon warrants of the director of accounts and reports issued pursuant to vouchers approved by the secretary of health and environment for the purposes set forth in this section.


Article 16a. – Radon Measurement and Mitigation.
K.S.A. 48-16a01. Radon certification law. K.S.A. 2019 Supp. 48-16a01 through 48-16a12, and amendments thereto, shall be known and may be cited as the radon certification law.

History: L. 2010, ch. 94, § 1; July 1.

K.S.A. 48-16a02. Same; definitions. As used in the radon certification law:

(a) "Mitigate" means to repair or alter a building or design for the purpose in whole or in part of reducing the concentration of radon in the indoor atmosphere.

(b) "Person" means any individual, corporation, partnership, firm, association, trust, estate, public or private institution, group, agency, state, political subdivision or agency of a state or political subdivision, or any legal successor or representative thereof.

(c) "Radon (Rn)" means the naturally occurring, colorless, odorless, radioactive gaseous element formed by radioactive decay, including radon 222, radon 220 (thoron), radon decay products and radon progeny or as defined by rules and regulations adopted by the secretary.

(d) "Secretary" means the secretary of the department of health and environment.

(e) "Measurement" or "test" means the: (1) Examination of a building, soil, water or air for the presence of radon, including taking air or soil samples; or (2) diagnosis of the source of radon contamination.

(f) "Radon measurement business" means a business which performs radon measurement and is either owned by, employees [employs], or retains as a consultant a certified radon measurement technician.
(g) "Radon mitigation business" means a business which performs radon mitigation services and is either owned by, employees [employs] or retains as a consultant a certified radon mitigation technician.

(h) "Radon measurement laboratory" means a business that performs laboratory analysis of radon measurement devices or samples, but does not include the field analysis of continuous radon monitors or continuous working level monitors.

(i) "Department" means the department of health and environment.

History: L. 2010, ch. 94, § 2; July 1.

K.S.A. 48-16a03. Same; certification program; rules and regulations, standards and guidelines; implementation agreements. (a) The secretary shall establish a certification program for certified persons performing radon tests or mitigation in the state.

(b) The secretary shall adopt rules and regulations necessary to administer and implement the provisions of the radon certification law. Such rules and regulations shall be adopted no later than July 1, 2011.

(c) Within the limitations of appropriation acts, the secretary may employ personnel necessary to carry out the provisions of the radon certification law and rules and regulations adopted thereunder.

(d) The secretary may enter into agreements with public or private agencies for the implementation of the radon certification law.

(e) The secretary shall have no authority to adopt rules, regulations, standards or guidelines for the acceptable or permissible level of radon gas concentrations in residential or commercial structures that are more stringent, restrictive or expansive than the applicable federal standards or guidelines adopted or approved by the United States environmental protection agency.

History: L. 2010, ch. 94, § 3; July 1.

K.S.A. 48-16a04. Same; fees. (a) The secretary may establish a schedule of fees to pay the costs of administration and implementation of the radon certification law. The secretary shall
remit all moneys received from fees to the state treasurer in accordance with the provisions of K.S.A. 75-4215, and amendments thereto. Upon receipt of each such remittance, the state treasurer shall deposit the entire amount in the state treasury and credit it to the radiation control operations fee fund established by K.S.A. 48-1625, and amendments thereto.

(b) Subject to the limitations of this section, the secretary may impose and collect fees, in advance for:

- Radon measurement technician application fee,
  - new and biannual renewal $100.00
- Radon mitigation technician application fee,
  - new and biannual renewal 100.00
- Radon measurement laboratory, application fee,
  - new and biannual renewal 250.00
- Returned check or insufficient check 50.00
- Late application fee, for each month or part thereof 25.00

History: L. 2010, ch. 94, § 4; July 1.

K.S.A. 48-16a05. Same; radon measurement technician; certification; application; training course; examination; when section not applicable. (a) A person may not perform radon measurements or represent or advertise that such person may perform radon measurements unless such person has been certified as a radon measurement technician by the department.

(b) Any person desiring to be certified as a certified radon measurement technician shall submit an application on a form prescribed by the department along with the nonrefundable application fee.

(c) A radon measurement technician shall comply with the requirements of the radon certification law and any rules and regulations adopted thereunder.

(d) (1) Except as provided by this section, no person shall be certified by the department as a certified radon measurement technician unless such person shall have completed successfully a training course and passed an examination on radon measurement offered by the national radon safety board, the national environmental health association, or another organization determined by the department to have a radon measurement certification examination equal to or better than the national environmental health association or the national radon safety board.
(2) Applicants who are certified by either the national environmental health association or the national radon safety board on July 1, 2011, and who have completed an approved training course and passed an examination on radon measurement at any time prior to July 1, 2011, shall be deemed to have met the requirements of paragraph (1).

(e) The provisions of this section shall not apply to any person:

(1) Performing radon measurements on a building owned by such person or where such person resides; provided, the testing is not performed in association with or related to the transfer of real property; or

(2) performing radon measurements without remuneration; provided, the testing is not performed in association with or related to the transfer of real property.

History: L. 2010, ch. 94, § 5; July 1.

**K.S.A. 48-16a06. Same; radon mitigation technician; certification; training course; examination; when section not applicable.** (a) A person may not perform radon mitigation or represent or advertise that such person may perform radon mitigation unless such person has been certified by the department.

(b) Any person desiring to be certified as a radon mitigation technician shall submit an application on a form prescribed by the department along with the nonrefundable application fee.

(c) A radon mitigation technician shall comply with the requirements of the radon certification law and any rules and regulations adopted thereunder.

(d) (1) Except as provided by this section, no person shall be certified by the department as a certified radon mitigation technician unless such person shall have completed successfully a training course and passed an examination on radon mitigation offered by the national radon safety board, the national environmental health association, or another organization determined by the department to have a radon mitigation certification examination equal to or better than the national environmental health association or the national radon safety board.
Applicants who are certified by either the national environmental health association or the national radon safety board on July 1, 2011, and who have completed an approved training course and passed an examination on radon mitigation at any time prior to July 1, 2011, shall be deemed to have met the requirements of paragraph (1).

(e) The provisions of this section shall not apply to:

(1) Any person testing or mitigating buildings owned or occupied by such person.

(2) Any person not otherwise certified under the radon certification law who incorporate radon control options during construction in conformance with guidance designated by the department including, but not limited to, Appendix F of the 2003 international residential code or the applicable sections of ASTM E1465 "Standard Practice for Radon Control Options for the Design and Construction of New Low Rise Residential Buildings." Any upgrade or modification of the system to make it an active mitigation system shall be done by persons certified by the department and certified under the radon certification law.

(3) Laborers performing specific mitigation system installation tasks under the direct on-site supervision of a certified radon mitigation technician.

(4) Trade professionals installing portions of a radon mitigation system at the request of a radon mitigation business and under the direct on-site supervision of a certified radon mitigation technician.

(5) Any person who sells, or offers for sale at a retail outlet, radon measurement devices, such as charcoal canisters if:

(A) The radon measurement devices are manufactured or supplied by a certified person by the department;

(B) the analysis, result and interpretation of such tests are performed by a laboratory certified by the department and sent directly to the purchaser;

(C) consultation on radon is provided only by a certified radon measurement technician; and

(D) the measurement devices are stored and displayed in a manner that maintains their integrity.

(6) Any person testing for or mitigating radon as part of radon training approved by the department, scientific research approved by the department or as a public service without
remuneration, and not performed for the purposes of transferring real property, as approved by the department.

History: L. 2010, ch. 94, § 6; July 1.

K.S.A. 48-16a07. Same; radon measurement business, conditions required to perform radon testing. A radon measurement business shall comply with the radon certification law and any rules and regulations adopted thereunder. A certified radon measurement technician who is certified with the department shall own, be employed by or be retained as a consultant by a radon measurement business when such business is performing radon measurements. All radon testing, including the initial placement and final retrieval of all measurement devices and post mitigation testing, shall be performed by a certified radon measurement technician.

History: L. 2010, ch. 94, § 7; July 1.

K.S.A. 48-16a08. Same; radon mitigation business; conditions required to perform radon mitigation. A radon mitigation business shall comply with the radon certification law and any rules and regulations adopted thereunder. A certified radon mitigation technician who is certified with the department shall own, be employed by or be retained as a consultant by a radon mitigation business when such business is performing radon mitigation. A radon mitigation business shall ensure that radon mitigation system installations are performed under the supervision of a certified radon mitigation technician.

History: L. 2010, ch. 94, § 8; July 1.

K.S.A. 48-16a09. Same; radon measurement laboratory; certification; application; conditions for certification. (a) A person may not perform laboratory analysis or represent or advertise that it may perform laboratory analysis of radon measurement devices or samples unless such person has been certified as a certified radon measurement laboratory by the department.

(b) Any person desiring to be certified as a certified radon measurement laboratory shall submit an application on a form
prescribed by the department along with the nonrefundable application fee.

(c) A certified radon measurement laboratory shall comply with the requirements of the radon certification law and any rules and regulations adopted thereunder. A person shall not be certified as an approved radon measurement laboratory unless such person has obtained a laboratory certification from the national environmental health association, the national radon safety board or a national proficiency testing program approved by the department.

(d) A designation as a certified radon measurement laboratory shall be nontransferable.

History: L. 2010, ch. 94, § 9; July 1.

K.S.A. 48-16a10. Same; reports on testing, analysis and mitigation; confidentiality; research studies; radon measurement or testing contracts, requirements. (a) Except as provided by subsections (d), (e) and (g), any person who tests for radon in this state, analyzes radon testing devices used in this state or performs radon mitigation in this state shall make a report of such testing, analysis or mitigation to the secretary. Such report shall be made within 90 days of performance of such testing, analysis or mitigation and shall include the address where the services were provided, location within the building, approximate age of the building, the date on which the service was provided, the type of equipment or test kit used for radon measurements, specific information regarding pre-mitigation or post-mitigation for radon measurements, and the results of any tests, analysis or mitigation.

(b) All information obtained pursuant to this section shall be confidential and shall not be subject to disclosure under the open records act.

(c) The secretary may conduct research studies utilizing the data required to be reported by subsection (a). No report or publication shall include names or addresses of individuals.

(d) The provisions of this section shall not apply to a person performing tests or mitigation on a building owned by such person or where such person resides.

(e) Radon measurement businesses certified under this act shall not be required to submit the results of a radon test to the Kansas department of health and environment unless the customer
or client consents to the release of this information in the contract to perform the radon test under subsection (f).

(f) Each contract between a certified radon measurement business and a client to perform a radon test shall include the following language: "It is standard procedure to provide the radon measurement information to the Kansas Department of Health and Environment. This data is required by law to be kept confidential and is used to conduct studies on radon and lung cancer incidence in Kansas. No report or publication will include names or addresses of individuals associated with the radon tests. If you (the client) agree that the radon testing information be disclosed to the Kansas Department of Health and Environment, you should initial here _______."

(g) If no contract is entered into by a certified radon measurement business and a client, the results of the radon testing shall be reported to the department in accordance with subsection (a).

History: L. 2010, ch. 94, § 10; July 1.

K.S.A. 48-16a11. Same; violations; penalties. (a) Any person who willfully violates any provision of the radon certification law or any rules and regulations adopted thereunder is guilty of a class B misdemeanor and is subject to a cease and desist order imposed by the secretary after providing notice and a hearing in accordance with the Kansas administrative procedure act.

(b) In addition to any other penalty provided by law and after providing notice and a hearing in accordance with the Kansas administrative procedure act, the secretary may impose a fine in an amount not to exceed $1,000 against any person who violates any provision of the radon certification law and any rule and regulation adopted or order issued thereunder; if any violation is a continuing one, each day of such violation shall constitute a separate violation for the purpose of computing the amount of the civil penalty. Any action by the secretary pursuant to this section is subject to review in accordance with the act for judicial review and civil enforcement of agency actions [Kansas judicial review act].

(c) On the request of the secretary, the attorney general is authorized to institute a civil action to collect any fine imposed pursuant to this section.
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(d) All moneys collected from fines imposed under this section shall be remitted to the state treasurer in accordance with the provisions of K.S.A. 75-4215, and amendments thereto. Upon receipt of each such remittance, the state treasurer shall deposit the entire amount in the state treasury to the credit of the state general fund.

(e) Any person certified for radon measurement or mitigation and who violates the provisions of the radon certification law or the rules and regulations adopted thereunder are subject to suspension or revocation of certification by the department in accordance with the Kansas administrative procedure act.

History: L. 2010, ch. 94, § 11; July 1.

K.S.A. 48-16a12. Same; severability. If any section, subsection, sentence, clause, phrase or word of this act is for any reason held to be unconstitutional, such decree shall not affect the validity of any remaining portion of this act.

History: L. 2010, ch. 94, § 12; July 1.