Agency
Department of Energy and Environmental Protection
Subject
Radiation Sources and Radioactive Materials
Inclusive Sections
§§ 19-24-1—Appendix A

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Radiation Sources and Radioactive Materials

Sec. 19-24-1. Scope

(a) Sections 19-24-2 to 19-24-14, inclusive, shall apply to all persons who receive, transfer, possess, manufacture, use, store, handle, transport or dispose of radioactive materials and to all persons who manufacture, use or operate other sources of ionizing radiation except as specifically exempted herein.

(b) Radioactive materials and other sources of ionizing radiation used or operated by or in the possession of an employee within the scope of his duties shall be considered to be used or operated by or in the possession of the employer.

(c) The provisions of sections 19-24-1 to 19-24-14, inclusive, of the Regulations of Connecticut State Agencies shall not be construed to apply to any person or source subject to sections 22a-153-1 to 22a-153-150, inclusive, of the Regulations of Connecticut State Agencies.

(Effective October 1, 1982; Amended February 11, 2026)

Sec. 19-24-2. Definitions

(a) As used in sections 19-24-1 to 19-24-14, inclusive:

"Airborne radioactive material" means any radioactive material dispersed in the air in the form of dusts, fumes, mists, vapors or gases;

"Calendar quarter" means any period determined according to either of the following methods:

(1) The first period of thirteen complete, consecutive calendar weeks in a calendar year; the second period of thirteen complete, consecutive calendar weeks in a calendar year; the third period of thirteen complete, consecutive calendar weeks in a calendar year; the fourth period of thirteen complete, consecutive calendar weeks in a calendar year. Alternately the four periods may consist of the first fourteen complete, consecutive calendar weeks; the next twelve complete, consecutive calendar weeks; the next fourteen complete, consecutive calendar weeks, and the last twelve complete, consecutive calendar weeks. If at the end of a calendar year there are any days not falling within a complete calendar week of that year, such days shall be included within the last complete calendar week of that year. If at the beginning of any calendar year there are days not falling within a complete calendar week of that year, such days shall be included within the last complete calendar week of the previous year.

(2) The first period of three consecutive months of any year beginning on any date in January. The second, third, and fourth periods of three consecutive months of any year accordingly beginning on the same date in April, July and October respectively. The fourth period shall extend into January of the succeeding year if necessary to complete a three-month period. The method of determining calendar quarters shall not be changed except at the beginning of a calendar year.

"Department" means the state department of environmental protection.

"High radiation area" means any area accessible to individuals in which there exists

radiation originating from radioactive materials or other sources of ionizing radiation at such levels that a major portion of the body could receive in any one hour a dose in excess of one hundred millirem.

"Individual" means any human being.

"Installation" means a location where for a period of more than thirty days one or more sources of radiation are received, possessed, operated, handled, used, stored or manufactured.

"Mobile source" means a source of radiation used, operated or stored outside an installation. If a mobile source is used routinely in one location, it shall be considered a fixed installation.

"Occupational dose" means exposure of an individual to radiation during or in the course of employment, provided occupational dose shall not be deemed to include any exposure to radiation which was administered for the purpose of diagnosis or therapy by or under supervision of a licensed healing arts practitioner as authorized by law.

"Owner of an installation" means the person owning or having actual control of sources of radiation located within the installation.

"Owner of a mobile source" means the person owning or having actual control thereof.

"Person" means any individual, corporation, partnership, firm, association, trust, estate, public or private institution, group, agency, political subdivision of this state, any other state or political subdivision or agency thereof, and any legal successor, representative, agent or agency of the foregoing.

"Radiation" means ionizing radiation.

"Radiation area" means any area accessible to individuals in which there exists radiation originating from radioactive materials or other sources of ionizing radiation at such levels that a major portion of the body could receive in any one hour a dose in excess of five millirem or in any five consecutive days a dose in excess of one hundred millirem.

"10 CFR 20" means title 10, chapter I, Code of Federal Regulations – Energy, part 20, "Standards For Protection Against Radiation," Rules and Regulations of the United States Nuclear Regulatory Commission. A current copy is on file with the department at Hartford.

(b) Definitions of certain other words and phrases as used in section 19-24-1 to 19-24-14, inclusive, are set forth in other sections including "airborne radioactivity area," defined in section 19-24-8 (a) (4) (A), "personnel monitoring equipment" defined in section 19-24-6 (a) (2), "survey" defined in section 19-24-7 (a) (1), "Dose" (rad, rem) defined in section 19-24-4 (a) (1), (2), and (3) and "units of measurement of radioactivity" defined in section 19-24-4 (b) (1), (2), and (3).

(c) Scientific and technical terms not herein specifically defined shall be used in accordance with definitions recommended by the National Council on Radiation Protection and Measurement.

(Effective October 1, 1982)

Sec. 19-24-3. Registration requirement

(a) (1) The owner of every installation or mobile source, not exempted by the provisions of section 19-24-8 (b), shall register the same or cause it to be registered with the department and such registration shall be on forms provided for this purpose by the department.

(2) Every new installation and mobile source shall be registered before the sources of radiation are operated, handled, used, stored or manufactured. Each owner of an installation or mobile source shall reregister installations and mobile sources each January and, in addition, at any time when any increase is contemplated in the number of sources, the source strength, the output or the types of radiation involved.

(3) Receipt and acknowledgement of registration shall not imply approval by the department of the receipt, transfer, possession, manufacture, storage, use, operation, handling, transportation or disposal of radioactive materials or the manufacture, use or operation of other sources of ionizing radiation described in the registration.

(b) The activities described below are exempted from the registration requirements of subsection (a).

(1) The possession or operation of devices emitting x-rays for diagnostic or therapeutic purposes by or under the supervision of a person or persons licensed to practice medicine, surgery, osteopathy, chiropractic, natureopathy, dentistry, podiatry or veterinary medicine and surgery as authorized by law; (Refer to sections 19-25a-1 to 19-25a-5.)

(2) The production, transportation, storage, use and disposal of naturally occurring radioactive materials of equivalent specific radioactivity not exceeding that of natural potassium;

(3) The production, transportation, storage, use and disposal of other radioactive materials not exceeding the quantities listed in Appendix A;

(4) The operation of equipment that is primarily not intended to produce radiation and that, by nature of design, does not produce radiation at the point of nearest approach in quantities sufficient to produce radiologic damage to a person. For the purposes of these regulations such equipment shall include: Time pieces, instruments, novelties or devices containing self-luminous elements, except during manufacture or repair of the self-luminous elements, and electrical equipment that is not primarily intended to produce radiation and that does not produce radiation greater than five-tenths mr per hour at any readily accessible point five centimeters from the surface. Such equipment shall not be exempt if it is used or handled in such a manner that any individual might receive a radiation dose exceeding one-tenth the limits established in section 19-24-5 (a). The production testing or production servicing of such equipment shall not be exempt;

(5) The transportation of any radioactive material in conformity with regulations of the United States Department of Transportation or other agency of the federal government having jurisdiction. Exemption from registration does not mean exemption from compliance with other pertinent provisions of these regulations.

(6) Any quantity of radioactive material determined by the U.S. Nuclear Regulatory Commission or an agreement state to be an “exempt quantity” or any item determined by

the U.S. Nuclear Regulatory Commission or an agreement state to be an "exempt item."

(Effective October 1, 1982)

Sec. 19-24-4. Definitions

(a) (1) "Dose," as used in sections 19-24-1 to 19-24-14, inclusive, means the quantity of radiation absorbed, per unit of mass, by the body or by any portion of the body. When a dose during a period of time is specified, the dose means the total quantity of radiation absorbed, per unit of mass, by the body or by any portion of the body during such period of time. Several different units of dose are in current use. The definitions are set forth in subdivisions (2) and (3) below.

(2) The "rad," as used in sections 19-24-1 to 19-24-14, inclusive, is a measure of the dose of any ionizing radiation to body tissues in terms of the energy absorbed per unit mass of the tissue. One rad is the dose corresponding to the absorption of one hundred ergs per gram of tissue. (One millirad (m rad) = 0.001 rad.)

(3) The "rem," as used in said sections, is a measure of the dose of any ionizing radiation to body tissue in terms of its estimated biological effect relative to a dose of one roentgen (r) of x-rays. (One millirem (mrem) = 0.001 rem.) The relation of the rem to other dose units depends upon the biological effect under consideration and upon the conditions of irradiation. For the purpose of this regulation, any of the following is considered to be equivalent to a dose of one rem:

(A) A dose of one roentgen due to x- or gamma radiation;

(B) A dose of one rad due to x-, gamma, or beta radiation;

(C) A dose of one-tenth rad due to neutrons or high energy protons;

(D) A dose of five-hundredths rad due to particles heavier than protons and with sufficient energy to reach the lens of the eye. If it is more convenient to measure the neutron flux, or equivalent, than to determine the neutron dose in rads, as provided in subparagraph (C) above, one rem of neutron radiation may for purposes of sections 19-24-1 to 19-24-14, inclusive, be assumed to be equivalent to fourteen million neutrons per square centimeter incident upon the body; or, if there exists sufficient information to estimate with reasonable accuracy the approximate distribution in energy of the neutrons, the incident number of neutrons per square centimeter equivalent to one rem may be estimated from the following table:

Neutron Flux Dose Equivalents

Neutron energy (Mev)	*Number of neutrons per square centimeter equivalent to a dose of 1 rem (neutrons/cm^2)*	*Average Flux to deliver 100 millirem in 40 hours (neutrons/cm^2 per sec.)*
Thermal	970 x 10^6	670
0.0001	720 x 10^6	500
0.005	820 x 10^6	570

0.02	400×10^6	280
0.1	120×10^6	80
0.5	43×10^6	30
1.0	26×10^6	18
2.5	29×10^6	20
5.0	26×10^6	18
7.5	24×10^6	17
10	24×10^6	17
10 to 30	14×10^6	10

(4) For determining exposure to x- or gamma rays with energies up to three Mev, the dose limits specified may be assumed to be equivalent to the "air dose." "Air dose" means the dose as measured by a properly calibrated appropriate instrument in air at or near the body surface in the region of highest dosage rate.

(b) **Units of radioactivity.**

(1) Radioactivity is commonly, and for purposes of sections 19-24-1 to 19-24-14, inclusive, shall be measured in terms of disintegrations per unit time or in curies. One curie (c) = 3.7×10^{10} disintegrations per second (dps) = 2.2×10^{12} disintegrations per minute (dpm). A commonly used submultiple of the curie is the microcurie (μc). One μc = 0.000001 c = 3.7×10^4 dps = 2.2×10^6 dpm.

(2) For purposes of said sections it may be assumed that the daughter activity concentrations in the following table are equivalent to an air concentration of 10^{-7} microcuries of Radon 222 per milliliter of air in equilibrium with the daughters RaA, RaB, RaC, and RaC.

Maximum time between collection and measurement (hours)	*Alpha-emitting daughter activity collected per milliliter of air*	
	Microcuries/cc	*Total alpha disintegrations per minute per cc.*
0.5	7.2×10^{-8}	0.16
1	4.5×10^{-8}	0.10
2	1.3×10^{-8}	0.028
3	0.3×10^{-8}	0.0072

The duration of sample collection and the duration of measurement should be sufficiently short compared to the time between collection and measurement, as not to have a statistically significant effect upon the results.

(3) Natural uranium and natural thorium.

(A) The purposes of sections 19-24-1 to 19-24-14, inclusive, the sum of 3.7×10^{10}

disintegrations per second from U-238 plus 3.7 x 10^{10} disintegrations per second from U-234 plus 9 x 10^{8} dis/sec from U-235. Also, a curie of natural thorium (thorium-natural) means the sum of 3.7 x 10^{10} dis/sec from Th^{232} plus 3.7 x 10^{10} dis/sec from Th^{228}.

(B) For the purposes of said sections, one curie of natural Uranium (U-natural) is equivalent to 3,000 kilograms, or 6,615 pounds of natural uranium; and one curie of natural thorium (thorium natural) is equivalent to 9,000 kilograms or 19,850 pounds of natural thorium.

(Effective October 1, 1982)

Sec. 19-24-5. Maximum doses

(a) (1) Except as provided in subdivision (2), no person shall receive, transfer, possess, manufacture, use, operate, store, handle, transport or dispose of radioactive materials, or manufacture, use or operate other sources of ionizing radiation, in such a manner as to cause any employee to receive in any period of one calendar quarter, from radioactive material and other sources of ionizing radiation, an occupational dose in excess of the limits specified in the following table.

		Rem Per Calendar Quarter
1.	Whole body; head and trunk; active blood-forming organs; lens of eyes, or gonads	1 1/4
2.	Hands and forearms; feet and ankles	18 3/4
3.	Skin of whole body	7 1/2

(2) An employee can be permitted to receive an occupational dose to the whole body greater than that permitted under subdivision (1) above, provided:

(A) During any calendar quarter the dose to the whole body from radioactive material and other sources of radiation shall not exceed three rem; and

(B) The dose to the whole body when added to the accumulated occupational dose to the whole body shall not exceed five (N-18) rem where "N" equals the individual's age in years at his last birthday; and

(C) The individual's accumulated occupational dose to the whole body has been determined on a clear and legible record. In any case where it is not possible to obtain reports of the individual's occupational dose for a previous complete calendar quarter in which the individual received an occupational dose of radiation, it shall be assumed that the individual has received the occupational dose specified in whichever of the following columns apply:

Part of Body	*Column 1 Assumed exposure in rem for calendar quarters prior to January 1, 1961*	*Column 2 Assumed exposure in rem for calendar quarters beginning on or after January 1, 1961*
Whole body, gonads, active blood-forming organs, head and trunk, lens of eye	3 3/4	1 1/4

"Dose to the whole body" shall be deemed to include any dose to the whole body, gonads, active blood-forming organs, head and trunk or lens of eye.

(b) (1) No person shall receive, transfer, possess, manufacture, use, store, handle, transport or dispose of radioactive material in such a manner as to cause any employee to be exposed to airborne radioactive material in an average concentration in excess of the limits specified in Appendix B, Table 1, Column 1, 10 CFR 20.

(2) The limits given in Appendix B, Table 1, Column 1, 10 CFR 20 are based upon exposure to the concentrations specified for forty hours in any period of seven consecutive days. In any such period when the number of hours of exposure is less than forty, the limits specified in the table may be increased proportionately. In any such period where the number of hours of exposure is more than forty, the limits specified in the table may be decreased proportionately.

(3) "Expose," as used in section 19-24-1 to 19-24-14, inclusive, means that the individual is present in an airborne concentration.

(4) No allowance shall be made for use of protective clothing or equipment or particle size except as specifically approved by the commissioner of environmental protection or his representative.

(c) (1) No person shall receive, transfer, possess, manufacture, store, use, operate, handle, transport or dispose of sources of ionizing radiation in such a manner as to cause any employee who is under eighteen years of age to receive in any period of one calendar quarter from radioactive material or other sources of radiation an occupational dose in excess of ten per cent of the limits specified in the table in subsection (a).

(2) No person shall receive, transfer, possess, manufacture, store, use, operate, handle, transport or dispose of sources of ionizing radiation in such a manner as to cause any employee who is under eighteen years of age to be exposed to airborne radioactive material in an average concentration in excess of the limits specified in Appendix B, Table II, Column 1, 10 CFR 20. For the purpose of this section concentrations may be averaged over periods not greater than one week.

(3) No allowance shall be made for use of protective clothing or equipment or particle size except as specifically approved by the department.

(d) No person shall receive, transfer, possess, manufacture, use, operate, store, handle, transport or dispose of sources of ionizing radiation in such a manner as to cause any

individuals other than employees to receive in any period of one calendar year from radioactive materials or other sources of radiation a dose to the whole body in excess of 0.5 rem (average 10 mrem/week).

(e) Nothing in sections 19-24-1 to 19-24-14, inclusive, shall be interpreted as preventing intentional radiation exposure of individuals 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 General Statutes.

(Effective October 1, 1982)

Sec. 19-24-6. Personnel monitoring

(a) (1) Each owner of an installation or mobile source shall supply appropriate personnel monitoring equipment to and shall require the use of such equipment by:

(A) Each employee and other individual who receives, or is likely to receive, a dose in any calendar quarter in excess of twenty-five per cent of the applicable value specified in subsection (a) of section 19-24-5;

(B) Each employee and any other individual who is under eighteen years of age who receives or is likely to receive a dose in any calendar quarter in excess of five per cent of the applicable value specified in said subsection (a);

(C) Each individual who enters a high radiation area.

(2) As used in sections 19-24-1 to 19-24-14, inclusive, "personnel monitoring equipment" means devices designed to be worn or carried by an individual for the purpose of measuring the dose received (e.g., film badges, pocket chambers, pocket dosimeters, film rings, etc.).

(b) Each owner of an installation or mobile source shall maintain records showing the radiation exposures of all individuals for whom personnel monitoring is required. The doses entered on the records shall be for periods of time not exceeding one calendar quarter. Personnel monitoring records maintained in accordance with provisions of this section shall be available for inspection by the department's representatives upon request.

(Effective October 1, 1982)

Sec. 19-24-7. Surveys

(a) (1) As used in sections 19-24-1 to 19-24-14, inclusive, "Survey" means an evaluation of the radiation hazards incident to the receipt, transfer, possession, manufacture, storage, use, operation, handling, transportation or disposal of radioactive materials or other sources of radiation under a specific set of conditions. When appropriate, such evaluation shall include a physical survey of the location of materials and equipment and measurements of levels of radiation or of concentrations of radioactive material present.

(2) Each owner of an installation or mobile source shall make or cause to be made such surveys as may be necessary for him to comply with the provisions of sections 19-24-1 to 19-24-14, inclusive.

(3) The adequacy of surveys shall be subject to review by the department's

representatives.

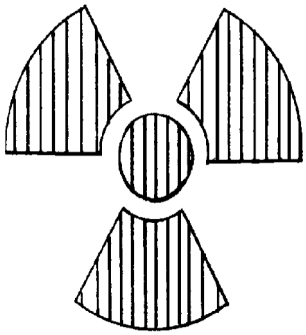
(b) Each owner of an installation or mobile source shall maintain records showing the results of the required surveys. Records of surveys shall be available for inspection by the department's representatives upon request.

(Effective October 1, 1982)

Sec. 19-24-8. Radiation information labeling

(a) (1) **Radiation symbol**

(A) The symbol shall use the conventional radiation caution colors (magenta or purple on yellow background). The symbol is the conventional three bladed design.



RADIATION SYMBOL

Cross hatched area shall be magenta or purple.

Background shall be yellow.

The boundaries of the three blades of the propeller-like symbol shall be confined within a 60° sector of the circle delineated by their outer edges and said blades shall be synmetrically distributed 60° apart. The radius (R) of the central circle of the symbol shall be the standard for its other dimensions as follows: Overall radius of symbol =5 R; shortest distance from circumference of central circle to inner edge of nearest blade =R/2.

(B) In addition to contents of signs and labels, any additional information which may be appropriate in aiding individuals to minimize exposure to radiation or to radioactive materials may be provided on or near such signs and labels.

(2) **Radiation areas**

(A) Each radiation area shall be conspicuously posted with a sign or signs bearing the radiation caution symbol and the words

CAUTION[1]

RADIATION AREA

This provision shall not apply to areas or rooms where x-ray equipment is used solely for diagnostic purposes by or under the direction of a healing arts practitioner as authorized by law.

[1]The word "danger" may be substituted for the word "caution" in the signs and labels prescribed by this section.

(3) **High radiation areas**

(A) Each high radiation area shall be conspicuously posted with a sign or signs bearing the radiation caution symbol and the words

CAUTION[1]

HIGH RADIATION AREA

This provision shall not apply to areas or rooms where x-ray equipment is used solely for diagnostic purposes by or under the direction of a healing arts practitioner as authorized by law.

(B) The department may require each high radiation area to be equipped with a control device which shall either cause the level of radiation to be reduced below that at which an individual might receive a dose of one hundred millirem in one hour upon entry into the area, or which shall energize a conspicuous, visible or audible alarm system in such a manner that the individuals entering are made aware of the entry. This provision shall not apply to mobile sources.

(4) **Airborne radioactivity area**

(A) As used in sections 19-24-1 to 19-24-14, inclusive, Airborne Radioactivity Area means any room, enclosure or area in which airborne radioactive materials exist in concentrations in excess of the amounts specified in Appendix B, Table 1, Column 1, 10 CFR 20 or any room, enclosure or area in which airborne radioactive material exists in concentrations which averaged over the number of hours in any week during which individuals are in the area exceed twenty-five per cent of the amounts specified in Appendix B, Table 1, Column 1, 10 CFR 20.

(B) Each airborne radioactivity area shall be conspicuously posted with a sign or signs bearing the radiation caution symbol and the words

CAUTION[1]

AIRBORNE RADIOACTIVITY AREA

(5) **Additional requirements**

(A) Each area or room in which radioactive material is used or stored and which contains any radioactive material (other than natural uranium or thorium) in any amount exceeding ten times the quantity of such material specified in Appendix C, 10 CFR 20 shall be conspicuously posted with a sign or signs bearing the radiation caution symbol and the words

CAUTION[1]

RADIOACTIVE MATERIAL(S)

(B) Each area or room in which natural uranium or thorium is used or stored in an amount exceeding one hundred times the quantity specified in Appendix C, 10 CFR 20 shall be conspicuously posted with a sign or signs bearing the radiation caution symbol, and the words

CAUTION[1]

RADIOACTIVE MATERIAL(S)

(C) Each area or room in which sources of ionizing radiation other than radioactive materials are used shall be conspicuously posted with a sign or signs bearing the radiation caution symbol and appropriate wording to designate the nature of the source or sources of ionizing radiation (example below)

CAUTION[1]

X-RAY

(6) **Containers**

(A) Each container in which is transported, stored, or used a quantity of any radioactive material (other than natural uranium or thorium) greater than the quantity of such material specified in Appendix C, 10 CFR 20 shall bear a durable, visible label bearing the radiation symbol and the words

CAUTION[1]

RADIOACTIVE MATERIAL

(B) Each container in which natural uranium or thorium is transported, stored or used in a quantity greater than ten times the quantity specified in Appendix C, 10 CFR 20 shall bear a durable, clearly visible label bearing the radiation caution symbol and the words

CAUTION[1]

RADIOACTIVE MATERIAL

(C) A label shall not be required if the concentration of the material in the container does not exceed that specified in Appendix B, Table 1, Column 2, 10 CFR 20.

(D) When containers are used for storage, the labels required shall state also the quantities and kinds of radioactive materials in the containers and the date of measurement of the quantities.

(b) (1) A room or area is not required to be posted with a caution sign because of the presence of a sealed source if the radiation level twelve inches from the surface of the source container or housing does not exceed five millirem per hour.

(2) Rooms or other areas in hospitals are not required to be posted with caution signs because of the presence of patients containing radioactive material, if there are personnel in attendance who shall take the precautions necessary to prevent the exposure of any individual to radiation or radioactive material in excess of the limits established in subsections (a), (b), (c) and (d) of section 19-24-5.

(3) Caution signs are not required to be posted at areas or rooms containing radioactive materials for periods of less than eight hours if the materials are constantly attended during such periods by an individual who shall take the precautions necessary to prevent the exposure of any individual to radiation or radioactive materials in excess of the limits established in subsections (a), (b), (c) and (d) of section 19-24-5.

(Effective October 1, 1982)

Sec. 19-24-9. Shipment in compliance with federal regulation

Shipment of radioactive materials shall be deemed in compliance with these regulations if packaged and labeled in compliance with regulations of the U.S. Department of Transportation and the other federal agencies having jurisdiction.

(Effective October 1, 1982)

Sec. 19-24-10. Instruction of employees. Report by former employer of exposure

(a) (1) All employees working in or frequenting any portion of an area where radioactive materials and other sources of ionizing radiation are received, possessed, manufactured, stored, used, operated or handled shall be informed of the occurrence of radioactive materials or other sources of ionizing radiation in such portions of the area; shall be instructed in the precautions and procedures which should be followed to minimize exposure, and shall be advised of reports of radiation exposure which employees may request.

(2) Each owner of an installation or mobile source shall keep a current copy of his ionizing source registration with the department and a current copy of sections 19-24-1 to 19-24-14, inclusive, available for employees' examination upon request.

(b) (1) At the request of a former employee each owner of an installation or mobile source shall furnish to the former employee in writing a report of the former employee's exposure to radiation including those shown in records maintained pursuant to section 19-24-6 (b). Such report shall cover each calendar quarter of the individual's employment involving exposure to radiation or such lesser period as may be requested by the employee. The report shall also include the results of any calculations and analyses of radioactive material deposited in the body of the employee, including those made pursuant to the provisions of section 19-24-12.

(2) The former employee's request should include appropriate identifying data such as social security number and dates and locations of employment.

(c) At the request of any employee each owner of an installation or mobile source shall advise such employee annually of the employee's exposure to radiation as shown in the records maintained pursuant to section 19-24-6 (b).

(Effective October 1, 1982)

Sec. 19-24-11. Reports of incidents or loss of radioactive material

(a) Each owner of an installation or mobile source shall make a report in writing within thirty days to the department of:

(1) Each exposure of an individual to radiation or concentrations of radioactive material in excess of any applicable limit in sections 19-24-1 to 19-24-14, inclusive.

(2) Any incident for which notification is required by subsection (b). At the request of the individual, or individuals, exposed, a copy of such report required shall be given to the individual, or individuals, exposed.

(b) (1)Each owner of an installation or mobile source shall immediately notify the

department by telephone, or other prompt means of communication, of any incident involving radioactive materials or other sources of ionizing radiation possessed by such owner which may have caused or threatens to cause:

(A) Exposure of the whole body of any individual to twenty-five rem or more of radiation, exposure of the skin of the whole body of any individual to one hundred fifty rem or more of radiation; or exposure of the feet, ankles, hands and forearms of any individual to three hundred seventy-five rem or more of radiation, or

(B) The release of radioactive materials in concentrations which if averaged over a period of twenty-four hours would exceed five thousand times the limits specified in Appendix B, Table II, 10 CFR 20.

(C) The loss of one working week or more of the operation of any facilities affected, or

(D) Damage to property in excess of one hundred thousand dollars.

(2) Each owner of an installation or mobile source shall within twenty-four hours, notify the department by telephone, or other prompt means of communication, of any incident involving radioactive material or other sources of ionizing radiation possessed by such owner which may have caused or threatens to cause:

(A) Exposure of the whole body of any individual to five rems or more of radiation, exposure of the skin of the whole body of any individual to thirty rems or more of radiation, or exposure of the feet, ankles, hands, and forearms to seventy-five rem or more of radiation, or

(B) The release of radioactive materials in concentrations which, if averaged over a period of twenty-four hours, would exceed five hundred times the limits specified in Appendix B, Table II, 10 CFR 20 or

(C) a loss of one day or more of the operation of any facilities affected, or

(D) Damage to property in excess of one thousand dollars.

(3) In case of loss of control of any radiation source in an installation or any mobile source due to mechanical failure or other accidential cause, the owner of the installation or mobile source shall be responsible for taking immediate steps to prevent or limit any health hazard that may result.

(c) Each owner of an installation or mobile source shall report by telephone, or other prompt means of communication, to the department immediately after its occurrence becomes known, any loss of radioactive materials in such quantities and under such circumstances that it appears that a substantial hazard may result to individuals.

(Effective October 1, 1982)

Sec. 19-24-12. Bio-assay reports

Where necessary or desirable to aid in determining the extent of any employee's exposure to radioactive materials, the department may require the owner of an installation or mobile source to make available to employees appropriate bio-assay services. Bio-assay reports shall be available for inspection by the department's representatives upon request.

(Effective October 1, 1982)

Sec. 19-24-13. Securing of materials against unauthorized removal

Radioactive materials shall be secured against unauthorized removal from the place of storage.

(Effective October 1, 1982)

Sec. 19-24-14. Disposal into ground, water or air

(a) Any person may apply to the department for approval of proposed procedures to dispose radioactive materials into the ground, water and air environment in a manner not otherwise authorized in sections 19-24-1 to 19-24-14, inclusive. Each application should include a description of the radioactive material or materials involved, including the quantities and kinds of such material and the levels of radioactivity involved and the proposed manner and conditions of disposal. The application should also include an analysis and evaluation of pertinent information as to the nature of the environment, including topographical, geological, meteorological and hydrological characteristics; usage of ground and surface waters in the general area, the nature and location of other potentially affected facilities and procedures to be observed to minimize the risk of unexpected or hazardous exposures.

(b) (1) No owner of an installation or mobile source shall possess, use or transfer radioactive material in such a manner as to release into the air or bodies of water outside an installation any concentration of radioactive material in excess of the limits specified in Appendix B, Table II, 10 CFR 20. For the purposes of this subdivision, concentrations may be averaged over periods not greater than one year.

(2) Determinations as to the concentrations of radioactive material shall be made with respect to the point where such material leaves the control of the owner. Where the radioactive material is discharged through a stack, tube, pipe or similar conduit, the determinations may be made with respect to the point where the material leaves such conduit.

(c) No owner of an installation or mobile source shall discharge radioactive materials into a sanitary sewage system unless:

(1) It is readily soluble or dispersible in water;

(2) The quantity of radioactive material released into the system by the owner in any one day does not exceed the larger of the quantities specified in subparagraphs (A) and (B) as follows:

(A) The quantity which if diluted by the average daily quantity of sewage released into the sewer from the installation or mobile source, will result in an average concentration equal to the limits specified in Appendix B, Table 1, Column 2, 10 CFR 20.

(B) Ten times the quantity of such material specified in Appendix C 10 CFR 20.

(3) The quantity of any radioactive material released by the owner of an installation or mobile source in any one month if diluted by the average monthly quantity of water released will not result in an average concentration exceeding the limits specified in Appendix B, Table 1, Column 2, 10 CFR 20.

(4) The gross quantity of radioactive material released into the sewerage system does not exceed one curie per year or other limits as may be specified in 10 CFR 20. Discharge of excreta from individuals undergoing medical diagnosis or therapy with radioactive material shall be exempt from the limitations contained in this subsection.

(d) No owner of an installation or mobile source shall dispose of radioactive material by dumping or by burial unless:

(1) The total quantity of radioactive material or materials buried in any one location does not exceed at the time of burial one thousand times the amounts specified in Appendix C, 10 CFR 20.

(2) Burial is at a minimum depth of four feet.

(3) Successive burials are separated by distances of at least six feet and not more than twelve burials are made in any year, and

(4) The area is approved by the department for burial of radioactive materials.

(e) No owner of any installation or mobile source shall treat or dispose of radioactive material by incineration except in accordance with plans and procedures specifically approved by the department.

(f) Each owner of an installation or mobile source shall maintain records of disposal of waste radioactive material. Such records shall be available for review by the department's representatives upon request.

Appendix A

Quantities of Radioactive Materials Exempted from Registration Requirements

Materials in Sealed Sources

Radioactive materials in sealed sources not exceeding 1 millicurie for a given installation.

Materials Not in Sealed Sources

1. Not more than 1 microcurie total quantity of any one or any combination of the following:

Pb^{210}, Ra^{226}, Ac^{227}, Pu^{239}, Am^{241}, Cm^{242}, Po^{210}, At^{211}, U^{233}

2. Not more than 10 microcuries total quantity of any one or any combination of the following:

Sc^{46}, Co^{60}, Sr^{90}, Ag^{105}, Ru^{106}, Te^{129}, I^{131}, Cs^{137}, Ce^{144}, Eu^{154}, W^{181}, Re^{183}, Ir^{192}

3. Not more than 100 microcuries total quantity of any one or any combination of the following:

P^{32}, $C1^{36}$, Ca^{45}, Sc^{47}, Sc^{48}, V^{48}, Fe^{59}, Zn^{65}, Ga^{72}, As76, Rb^{86}, Sr^{89}, Y^{91}, Nb^{95}, Tc^{96}, Rh^{105}, Cd^{109}, Ag^{111}, Sn^{113}, Te^{127}, Ba^{140}, La^{140}, Pr^{143}, Sm^{151}, Ho^{166}, Tm^{170}, Lu^{177}, Ta^{182}, Pt^{191}, Pt^{193}, Au^{198}, Au^{199}, Tl^{200}, Pb^{203}, Tl^{204}, Th^{234}

4. Not more than 1,000 microcuries total quantity of any one or any combination of the following:

H^{3}, Be^{7}, C^{14}, Na^{24}, S^{35}, K^{42}, Cr^{51}, Fe^{55}, Mn^{56}, Ni^{59}, Gu^{64}, Ge^{71}, Mo^{99}, Pd^{103}, Pm^{147}, Ir^{190}, Au^{196}, Tl^{201}, Tl^{202}; natural uranium; natural thorium.

5. Not more than 10 microcuries of any one or of any combination of any radioactive materials not specified above.

Sec. Appendix A.

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