

**Title 33**  
**ENVIRONMENTAL QUALITY**  
**Part XV. Radiation Protection**

**Chapter 1. General Provisions**

**§102. Definitions and Abbreviations**

**A.** As used in these regulations, these terms have the definitions set forth below. Additional definitions used only in a certain chapter may be found in that chapter.

\* \* \*

***Metric Prefixes and Abbreviations—***

|          |              |                            |          |              |                            |
|----------|--------------|----------------------------|----------|--------------|----------------------------|
| <b>c</b> | <b>centi</b> | <b>(=10<sup>-2</sup>)</b>  | <b>f</b> | <b>femto</b> | <b>(=10<sup>-15</sup>)</b> |
| <b>m</b> | <b>milli</b> | <b>(=10<sup>-3</sup>)</b>  | <b>k</b> | <b>kilo</b>  | <b>(=10<sup>3</sup>)</b>   |
| <b>μ</b> | <b>micro</b> | <b>(=10<sup>-6</sup>)</b>  | <b>M</b> | <b>mega</b>  | <b>(=10<sup>6</sup>)</b>   |
| <b>n</b> | <b>nano</b>  | <b>(=10<sup>-9</sup>)</b>  | <b>G</b> | <b>giga</b>  | <b>(=10<sup>9</sup>)</b>   |
| <b>p</b> | <b>pico</b>  | <b>(=10<sup>-12</sup>)</b> | <b>T</b> | <b>tera</b>  | <b>(=10<sup>12</sup>)</b>  |

\* \* \*

*Shallow Dose Equivalent (H<sub>s</sub>)*—~~applies to the external exposure of the skin of the whole body or the skin of an extremity, and is taken as the dose equivalent at a tissue depth of 0.007 centimeter (7 mg/cm<sup>2</sup>) averaged over an area of 1 square centimeter, which applies to the external exposure of the skin or an extremity.~~

\* \* \*

**B.** ~~The following metric prefixes and abbreviations are used in these regulations:~~

|          |              |                            |          |              |                            |
|----------|--------------|----------------------------|----------|--------------|----------------------------|
| <b>e</b> | <b>centi</b> | <b>(=10<sup>-2</sup>)</b>  | <b>f</b> | <b>femto</b> | <b>(=10<sup>-15</sup>)</b> |
| <b>m</b> | <b>milli</b> | <b>(=10<sup>-3</sup>)</b>  | <b>k</b> | <b>kilo</b>  | <b>(=10<sup>3</sup>)</b>   |
| <b>μ</b> | <b>micro</b> | <b>(=10<sup>-6</sup>)</b>  | <b>M</b> | <b>mega</b>  | <b>(=10<sup>6</sup>)</b>   |
| <b>n</b> | <b>nano</b>  | <b>(=10<sup>-9</sup>)</b>  | <b>G</b> | <b>giga</b>  | <b>(=10<sup>9</sup>)</b>   |
| <b>p</b> | <b>pico</b>  | <b>(=10<sup>-12</sup>)</b> | <b>T</b> | <b>tera</b>  | <b>(=10<sup>12</sup>)</b>  |

**AUTHORITY NOTE:** Promulgated in accordance with R.S. 30:2001 et seq.

**HISTORICAL NOTE:** Promulgated by the Department of Environmental Quality, Nuclear Energy Division, LR 13:569 (October 1987), repealed and

repromulgated by Office of Air Quality and Radiation Protection, Radiation Protection Division, LR 18:34 (January 1992), amended LR 19:1421 (November 1993), LR 20:650 (June 1994), LR 22:967 (October 1996), LR 24:2089 (November 1998), repromulgated LR 24:2242 (December 1998), amended by the Office of Environmental Assessment, Environmental Planning Division, LR 26:2563 (November 2000), LR 26:2767 (December 2000), LR 30:

### **§110. Prohibited Uses**

A. - D. ...

E. No person shall intentionally apply or allow to be applied, either directly or indirectly, radiation to human beings except by, or under the supervision of, persons licensed by Louisiana to practice the healing arts and who are authorized to use radiation on humans, ~~except that fluoroscopy on humans shall be performed only by a physician or dentist.~~

1. Supervision, as used in this Subsection, shall mean the responsibility for, and control of, quality, radiation safety, and technical aspects of the application of radiation to human beings for diagnostic and therapeutic purposes.

2. This prohibition shall not be deemed to apply to persons who are exposed to radiation occupationally, or as otherwise provided in these regulations.

NOTE: ~~Repealed. Supervision, as used in this Subsection, shall mean the responsibility for, and control of, quality, radiation safety, and technical aspects of the application of radiation to human beings for diagnostic and therapeutic purposes. This prohibition shall not be deemed to apply to persons who are occupationally exposed to radiation or as otherwise provided in these regulations.~~

AUTHORITY NOTE: Promulgated in accordance with R.S. 30:2001 et seq.

HISTORICAL NOTE: Promulgated by the Department of Environmental Quality, Nuclear Energy Division, LR 13:569 (October 1987), repealed and repromulgated by the Office of Air Quality and Radiation Protection, Radiation Protection Division, LR 18:34 (January 1992), amended by the Office of Environmental Assessment, Environmental Planning Division, LR 26:2564 (November 2000), LR 30:

## **Chapter 3. Licensing of Radioactive Material**

### **Subchapter D. Specific Licenses**

#### **§326. Special Requirements for Issuance of Certain Specific Licenses for Radioactive Material**

A. - E.1.b. ...

c. The applicant will have an adequate internal inspection system, or other management control, to ensure that license provisions, regulations, and the applicant's operating and emergency procedures are followed by radiographers ~~and~~

radiographers' assistants; the inspection system shall include the performance of internal inspections not to exceed ~~three~~ six months and the retention of records of such inspections for three consecutive years.

d. - k. ...

AUTHORITY NOTE: Promulgated in accordance with R.S. 30:2001 et seq.

HISTORICAL NOTE: Promulgated by the Department of Environmental Quality, Nuclear Energy Division, LR 13:569 (October 1987), repealed and repromulgated by the Office of Air Quality and Radiation Protection, Radiation Protection Division, LR 18:34 (January 1992), amended LR 24:2092 (November 1998), amended by the Office of Environmental Assessment, Environmental Planning Division, LR 26:2569 (November 2000), LR 27:1228 (August 2001), LR 30:

## Chapter 4. Standards for Protection Against Radiation

### Subchapter B. Radiation Protection Programs

#### §410. Occupational Dose Limits for Adults

A. - A.1.b. ...

2. the annual limits to the lens of the eye, to the skin of the whole body, and to the skin of the extremities, which are:

a. ...

b. a shallow dose equivalent of 0.5 Sv (50 rem) to the skin of the whole body or to the skin of any extremity.

B. ...

C. The assigned deep dose equivalent ~~and shallow dose equivalent shall~~ must be for the ~~portion~~ part of the body receiving the highest exposure, ~~determined as follows:~~ The assigned shallow dose equivalent must be the dose averaged over the contiguous 10 square centimeters of skin receiving the highest exposure.

~~1.~~ 1. ~~The~~ The deep dose equivalent, lens 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's monitoring device was not in the region of highest potential exposure or the results of individual monitoring are unavailable;

D2. ~~If~~ When a protective apron is worn while working with medical fluoroscopic equipment and monitoring is conducted as specified in LAC 33:XV.431, the effective dose equivalent for external radiation shall be determined ~~as follows:~~ using one of the following methods.

1a. ~~When~~ When only one individual monitoring device is used and it is located at the neck outside the protective apron, the reported deep dose equivalent shall be the effective dose equivalent for external radiation; ~~or.~~

2b. ~~When~~ When only one individual monitoring device is used and it is located at the neck outside the protective apron, and the reported dose exceeds 25 percent

of the limit specified in this Section, the reported deep dose equivalent value, multiplied by 0.3, shall be the effective dose equivalent for external radiation; ~~or~~.

~~3e.~~ 3e. ~~When~~ 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.

~~ED.~~ ED. Derived air concentration (DAC) and annual limit on intake (ALI) values are specified in Table I of Appendix B and may be used to determine the individual's dose and to demonstrate compliance with the occupational dose limits. See LAC 33:XV.476.

~~FE.~~ FE. 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. See Endnote 3 of Appendix B.

~~GF.~~ GF. The 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. See LAC 33:XV.414.E and F.

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## **Chapter 5. Radiation Safety Requirements for Industrial Radiographic Operations**

### **§503. Definitions**

A. As used in this Chapter, the following definitions apply:

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*Permanent Radiographic Installation*—~~an enclosed shielded room, cell, or vault, not located at a temporary jobsite, installation or structure designed or intended for radiography and in which radiography is regularly performed.~~

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AUTHORITY NOTE: Promulgated in accordance with R.S. 30:2001 et seq.

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Air Quality and Radiation Protection, Radiation Protection Division, LR 20:653 (June 1994), LR 23:1138 (September 1997), amended by the Office of Environmental Assessment, Environmental Planning Division, LR 26:2581 (November 2000), LR 26:2772 (December 2000), LR 27:1231 (August 2001), LR 29:34 (January 2003), LR 30:

## **Subchapter A. Equipment Control**

### **§541. Locking of Sources of Radiation**

A. Each radiographic exposure device must 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 and/or its container must be kept locked, with the key removed at all times for a keyed-lock, when not under the direct surveillance of a radiographer, ~~a radiographer's assistant~~, or a trainee except at permanent radiographic installations in accordance with LAC 33:XV.585. In addition, during radiographic operations the sealed source assembly must be secured in the shielded position each time the source is returned to that position.

B. Each sealed source storage container and source changer must 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 must be kept locked, with the key removed at all times for a keyed-lock, when containing sealed sources, except when under the direct surveillance of a radiographer, ~~a radiographer's assistant~~, or trainee.

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HISTORICAL NOTE: Promulgated by the Department of Environmental Quality, Nuclear Energy Division, LR 13:569 (October 1987), amended by the Office of Air Quality and Radiation Protection, Radiation Protection Division, LR 20:653 (June 1994), amended by the Office of Environmental Assessment, Environmental Planning Division, LR 27:1232 (August 2001), LR 28:306 (February 2002), LR 30:

## **Chapter 14. Regulation and Licensing of Naturally Occurring Radioactive Material (NORM)**

### **§1410. General Licenses: Pipe Yards, Storage Yards, or Production Equipment Yards**

A. A general license is hereby issued for pipe yards or storage yards or production equipment yards to receive, possess, process, and clean tubular goods or equipment ~~which~~ that are contaminated with scale or residue but do not exceed 50 microrentgens per hour, provided:

1. the department is notified ~~within~~ at least 90 days of the effective date of these regulations of the intention of the facility to receive prior to receipt of

tubular goods or equipment ~~which~~ that are contaminated with scale or residue but do not exceed 50 microoentgens per hour;

2. - 6. ...

7. a plan for cleanup is submitted to the Office of Environmental Services, Permits Division within 180 days of the ~~effective date of these regulations for existing facilities that have~~ discovery of NORM contaminated soil in excess of the limit in LAC 33:XV.1410.A.6. The plan shall include a schedule for cleanup that is to be approved by the department. The general licensee may include in this plan an application to the department for a one time authorization to perform this cleanup or use a specific licensee; and

A.8. - B. ...

AUTHORITY NOTE: Promulgated in accordance with R.S. 30:2001 et seq.

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