



**State of Louisiana**  
**Department of Environmental Quality**

M.J. "MIKE" FOSTER, JR.  
 GOVERNOR

March 6, 2002

J. DALE GIVENS  
 SECRETARY

02 MAR 20 PM 3:40  
 STP

Paul Lohaus  
 Deputy Director, Office of State and Tribal Programs  
 O3H2O  
 US Nuclear Regulatory Commission  
 Washington, DC 20555-0001

Dear Mr. Lohaus

In accordance with the Guidance for Use by Agreement States for Submitting Regulations for NRC Staff Review, I have enclosed a disk containing the final rule of log # RP029\* amending the Louisiana Administrative Code, Title 33, Part XV, Radiation Protection. The document is in Word 2000 9.0 version.

This rule package consists almost entirely of amendments that are required for purposes of compatibility (category A, B, or C). All of the amendments in this package should meet NRC compatibility criteria. Wherever possible, the editor inserted the exact wording of the 10 CFR rules into the amendment, and followed Federal Register guidelines regarding Agreement State compatibility.

Regulations requiring amendments were identified from SA-200, Compatibility Categories and Health and Safety Identification for NRC Regulations and Other Program Elements, and SA-201, Review of State Regulations.

- Respiratory Protection and Controls to Restrict Internal Exposures – Part 20 (64 FR 54543)

If you have any questions regarding these regulation amendments, please contact me at (225) 765-0232 or Eddie Stelly of my staff at (225)-765-0397, or email [eddies@ldea.org](mailto:eddies@ldea.org)

Sincerely,

Robert P. Hannah  
 Administrator

Enclosures:  
 As stated

MLO



**Title 33**  
**ENVIRONMENTAL QUALITY**  
**Part XV. Radiation Protection**  
**Chapter 4. Standards for Protection Against Radiation**  
**Subchapter A. General Provisions**

**§403. Definitions**

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

*Air-Purifying Respirator*—a respirator with an air-purifying filter, cartridge, or canister that removes specific air contaminants by passing ambient air through the air-purifying element.

\* \* \*

*Assigned Protection Factor (APF)*—the expected work place level of respiratory protection that would be provided by a properly functioning respirator or a class of respirators to properly fitted and trained users. Operationally, the inhaled concentration can be estimated by dividing the ambient airborne concentration by the APF.

*Atmosphere-Supplying Respirator*—a respirator that supplies the respirator user with breathing air from a source independent of the ambient atmosphere and includes supplied-air respirators (SARS) and self-contained breathing apparatus (SCBA) units.

\* \* \*

*Demand Respirator*—an atmosphere-supplying respirator that admits breathing air to the facepiece only when a negative pressure is created inside the facepiece by inhalation.

\* \* \*

*Disposable Respirator*—a respirator for which maintenance is not intended and that is designed to be discarded after excessive breathing resistance, sorbent exhaustion, physical damage, or end-of-service-life renders it unsuitable for use. Examples of this type of respirator are a disposable half-mask respirator or a disposable escape-only self-contained breathing apparatus (SCBA).

\* \* \*

*Filtering Facepiece (Dust Mask)*—a negative pressure particulate respirator with a filter as an integral part of the facepiece or with the entire facepiece composed of the filtering medium that is not equipped with elastomeric sealing surfaces and adjustable straps.

*Fit Factor*—a quantitative estimate of the fit of a particular respirator to a specific individual, which typically estimates the ratio of the concentration of a substance in ambient air to its concentration inside the respirator when worn.

*Fit Test*—the use of a protocol to qualitatively or quantitatively evaluate the fit of a respirator on an individual.

Helmet—a rigid respiratory inlet covering that also provides head protection against impact and penetration.

Hood—a respiratory inlet covering that completely covers the head and neck and may also cover portions of the shoulders and torso.

\* \* \*

Loose-Fitting Facepiece—a respiratory inlet covering that is designed to form a partial seal with the face.

\* \* \*

Negative Pressure Respirator (Tight Fitting)—a respirator in which the air pressure inside the facepiece is negative during inhalation with respect to the ambient air pressure outside the respirator.

\* \* \*

Positive Pressure Respirator—a respirator in which the pressure inside the respiratory inlet covering exceeds the ambient air pressure outside the respirator.

Powered Air-Purifying Respirator (PAPR)—an air-purifying respirator that uses a blower to force the ambient air through air-purifying elements to the inlet covering.

Pressure Demand Respirator—a positive pressure atmosphere-supplying respirator that admits breathing air to the facepiece when the positive pressure is reduced inside the facepiece by inhalation.

Qualitative Fit Test (QLFT)—a pass/fail fit test to assess the adequacy of respirator fit that relies on the individual's response to the test agent.

Quantitative Fit Test (QNFT)—an assessment of the adequacy of respirator fit by numerically measuring the amount of leakage into the respirator.

\* \* \*

Self-Contained Breathing Apparatus (SCBA)—an atmosphere-supplying respirator for which the breathing air source is designed to be carried by the user.

\* \* \*

Supplied-Air Respirator (SAR) or Airline Respirator—an atmosphere-supplying respirator for which the source of breathing air is not designed to be carried by the user.

Tight-Fitting Facepiece—a respiratory inlet covering that forms a complete seal with the face.

User Seal Check (Fit Check)—an action conducted by the respirator user to determine if the respirator is properly seated to the face (e.g., negative pressure check, positive pressure check, irritant smoke test, or isoamyl acetate check).

\* \* \*

AUTHORITY NOTE: Promulgated in accordance with R.S. 30:2001 et seq., and in particular R.S. 30:2104.

**HISTORICAL NOTE:** Promulgated by the Department of Environmental Quality, Office of Air Quality and Radiation Protection, Radiation Protection Division, LR 19:1421 (November 1993), amended LR 22:969 (October 1996), amended by the Office of Environmental Assessment, Environmental Planning Division, LR 26:2768 (December 2000), LR 28

### Subchapter E. Respiratory Protection and Controls to Restrict Internal Exposure in Restricted Areas

#### **§443. Application for Use of Higher Assigned Protection Factors**

A. The licensee shall obtain authorization from the department before using assigned protection factors in excess of those specified in Appendix A of this Chapter. The department may authorize a licensee to use higher assigned protection factors upon receipt of an application that:

1. describes the situation for which a need exists for higher protection factors; and
2. demonstrates that the respiratory protection equipment provides these higher protection factors under the proposed conditions of use.

**AUTHORITY NOTE:** Promulgated in accordance with R.S. 30:2001 et seq., and in particular R.S. 30:2104.

**HISTORICAL NOTE:** Promulgated by the Department of Environmental Quality, Office of Environmental Assessment, Environmental Planning Division, LR 28

### Appendix A

PROTECTION FACTORS FOR RESPIRATORS <sup>1</sup>				
Description <sup>2</sup>	Protection Factors <sup>4</sup>			Tested & Certified Equipment
	Modes <sup>3</sup>	Particulates Only	Particulates, gases, vapors <sup>5</sup>	
<b>I. Air-Purifying Respirators<sup>6</sup></b>				
Facepiece, half mask <sup>7</sup>	NP	10		30 CFR Part 11, Subpart K
Facepiece, full	NP	50		
Facepiece, half mask, full, or hood	PP	1,000		
<b>II. Atmosphere-Supplying Respirators</b>				
1. Air-line respirator				
Facepiece, half mask	CF		1,000	30 CFR Part 11, Subpart J
Facepiece, half mask	D		5	
Facepiece, full	CF		2,000	
Facepiece, full	D		5	
Facepiece, full	PD		2,000	
Hood	CF		<sup>8</sup>	
Suit	CF		<sup>9</sup>	<sup>10</sup>
2. Self-contained breathing apparatus (SCBA)				
Facepiece, full	D		50	30 CFR Part 11, Subpart H

Facepiece, full	PD		10,000 <sup>11</sup>	
Facepiece, full	RD		50	
Facepiece, full	RP		5,000 <sup>12</sup>	
<b>III. Combination Respirators</b>				
Any combination of air purifying and atmosphere-supplying respirators	Protection factor for type and mode of operation as listed above			30 CFR Part 11, Sec. 11.63(b)

### ENDNOTES

<sup>1</sup> For use in the selection of respiratory protective equipment to be used only where the contaminants have been identified and the concentrations, or possible concentrations, are known.

<sup>2</sup> Only for shaven faces and where nothing interferes with the seal of tight fitting facepieces against the skin. Hoods and suits are excepted.

<sup>3</sup> The mode symbols are defined as follows:

CF = continuous flow

D = demand

NP = negative pressure, that is, negative phase during inhalation

PD = pressure demand, that is, always positive pressure

PP = positive pressure

RD = demand, recirculating or closed circuit

RP = pressure demand, recirculating or closed circuit

<sup>4</sup> Protection Factors

a. The protection factor is a measure of the degree of protection afforded by a respirator, defined as the ratio of the concentration of airborne radioactive material outside the respiratory protective equipment to that inside the equipment, usually inside the facepiece, under conditions of use. It is applied to the ambient airborne concentration to estimate the concentrations inhaled by the wearer according to the following formula:

$$\text{Concentration inhaled} = \frac{\text{Ambient airborne concentration}}{\text{Protection factor}}$$

b. The protection factors apply:

(i) only for individuals trained in using respirators and wearing properly fitted respirators that are used and maintained under supervision in a well-planned respiratory protective program;

(ii) for air purifying respirators only when high efficiency particulate filters, above 99.97 percent removal efficiency by thermally generated 0.3  $\mu\text{m}$  dioctyl phthalate (DOP) test or equivalent, are used in atmospheres not deficient in oxygen and not containing radioactive gas or vapor respiratory hazards;

(iii) no adjustment is to be made for the use of sorbents against radioactive material in the form of gases or vapors;

(iv) for atmosphere-supplying respirators only when supplied with adequate respirable air. Respirable air shall be provided of the quality and quantity required in accordance with the National Institute for Occupational Safety and Health/Mine Safety and Health Administration certification described in 30 CFR Part 11. Oxygen and air shall not be used in the same apparatus.

<sup>5</sup> Excluding radioactive contaminants that present an absorption or submersion hazard. For tritium oxide, approximately one third of the intake occurs by absorption through the skin so that an overall protection factor of less than two is appropriate when atmosphere supplying respirators are used to protect against tritium oxide. If the protection factor for respiratory protective equipment is five, the effective protection factor for tritium is about 1.4; for equipment with protection factors of 10, the effective factor for tritium oxide is about 1.7; and for equipment with protection factors of 100 or more, the effective factor for tritium oxide is about 1.9. Air purifying respirators are not suitable for protection against tritium oxide. See also endnote 9 concerning supplied air suits.

<sup>6</sup> Canisters and cartridges shall not be used beyond service life limitations.

<sup>7</sup> Under chin type only. This type of respirator is not satisfactory for use where it might be possible, such as if an accident or emergency were to occur, for the ambient airborne concentrations to reach instantaneous values greater than 10 times the pertinent values in Table I, Column 3 of Appendix B of this Chapter. This type of respirator is not suitable for protection against plutonium or other high toxicity materials. The mask is to be tested for fit prior to use, each time it is donned.

<sup>8</sup> Hoods

a.—Equipment shall be operated in a manner that ensures that proper air flow rates are maintained. A protection factor of no more than 1000 may be utilized for tested and certified supplied air hoods when a minimum air flow of six cubic feet per minute ( $0.17 \text{ m}^3/\text{min}$ ) is maintained and calibrated air line pressure gauges or flow measuring devices are used. A protection factor of up to 2000 may be used for tested and certified hoods only when the air flow is maintained at the manufacturer's recommended maximum rate for the equipment, this rate is greater than six cubic feet per minute ( $0.17 \text{ m}^3/\text{min}$ ) and calibrated air line pressure gauges or flow measuring devices are used.

b.—The design of the supplied air hood or helmet, with a minimum flow of six cubic feet per minute ( $0.17 \text{ m}^3/\text{min}$ ) of air, may determine its overall efficiency and the protection it provides. For example, some hoods aspirate contaminated air into the breathing zone when the wearer works with hands over head. This aspiration may be overcome if a short cape like extension to the hood is worn under a coat or overalls. Other limitations specified by the department shall be considered before using a hood in certain types of atmospheres. See endnote 9.

<sup>9</sup> Appropriate protection factors shall be determined, taking into account the design of the suit and its permeability to the contaminant under conditions of use. There shall be a standby rescue person equipped with a respirator or other apparatus appropriate for the potential hazards and communications equipment whenever supplied air suits are used.

<sup>10</sup> No approval schedules are currently available for this equipment. Equipment is to be evaluated by testing or on the basis of reliable test information.

<sup>11</sup> This type of respirator may provide greater protection and be used as an emergency device in unknown concentrations for protection against inhalation hazards. External radiation hazards and other limitations to permitted exposure, such as skin absorption, must be taken into account in such circumstances.

<sup>12</sup> Quantitative fit testing shall be performed on each individual, and no more than 0.02 percent leakage is allowed with this type of apparatus. Perceptible outward leakage of gas from this or any positive pressure self contained breathing apparatus is unacceptable because service life will be reduced substantially. Special training in the use of this type of apparatus shall be provided to the wearer.

Note:

1. Protection factors for respirators approved by the U.S. Bureau of Mines/National Institute for Occupational Safety and Health, according to applicable approvals for respirators for type and mode of use to protect against airborne radionuclides, may be used to the extent that they do not exceed the protection factors listed in this table. The protection factors listed in this table may not be appropriate to circumstances where chemical or other respiratory hazards exist in addition to radioactive hazards. The selection and use of respirators for such circumstances should take into account applicable approvals of the U.S. Bureau of Mines/National Institute for Occupational Safety and Health.

2. Radioactive contaminants, for which the concentration values in Table I, Column 3 of Appendix B of this Chapter are based on internal dose due to inhalation, may present external exposure hazards at higher concentrations. Under these circumstances, limitations on occupancy may have to be governed by external dose limits.

**APPENDIX A**

<b>ASSIGNED PROTECTION FACTORS FOR RESPIRATORS<sup>a</sup></b>		
<b>Type of Respirator</b>	<b>Operating Mode</b>	<b>Assigned Protection Factors (APF)</b>
<b>I. Air-Purifying Respirators [Particulate<sup>b</sup> Only]<sup>c</sup></b>		
<u>Filtering facepiece, disposable<sup>d</sup></u>	<u>Negative pressure</u>	<u>(<sup>d</sup>)</u>
<u>Facepiece, half<sup>e</sup></u>	<u>Negative pressure</u>	<u>10</u>
<u>Facepiece, full</u>	<u>Negative pressure</u>	<u>100</u>
<u>Facepiece, half</u>	<u>Powered air-purifying respirators</u>	<u>50</u>
<u>Facepiece, full</u>	<u>Powered air-purifying respirators</u>	<u>1000</u>
<u>Helmet/hood</u>	<u>Powered air-purifying respirators</u>	<u>1000</u>
<u>Facepiece, loose fitting</u>	<u>Powered air-purifying respirators</u>	<u>25</u>
<b>II. Atmosphere-Supplying Respirators [particulate, gases, and vapors<sup>f</sup>]</b>		
<b>1. Airline Respirator:</b>		
<u>Facepiece, half</u>	<u>Demand</u>	<u>10</u>
<u>Facepiece, half</u>	<u>Continuous flow</u>	<u>50</u>
<u>Facepiece, half</u>	<u>Pressure demand</u>	<u>50</u>
<u>Facepiece, full</u>	<u>Demand</u>	<u>100</u>
<u>Facepiece, full</u>	<u>Continuous flow</u>	<u>1000</u>
<u>Facepiece, full</u>	<u>Pressure demand</u>	<u>1000</u>
<u>Helmet/hood</u>	<u>Continuous flow</u>	<u>1000</u>
<u>Facepiece, loose-fitting</u>	<u>Continuous flow</u>	<u>25</u>
<u>Suit</u>	<u>Continuous flow</u>	<u>(<sup>g</sup>)</u>
<b>2. Self-Contained Breathing Apparatus (SCBA):</b>		
<u>Facepiece, full</u>	<u>Demand</u>	<u>100<sup>h</sup></u>
<u>Facepiece, full</u>	<u>Pressure demand</u>	<u>10,000<sup>i</sup></u>
<u>Facepiece, full</u>	<u>Demand, recirculating</u>	<u>100<sup>h</sup></u>
<u>Facepiece, full</u>	<u>Positive pressure, recirculating</u>	<u>10,000<sup>i</sup></u>
<b>III. Combination Respirators:</b>		
<u>Any combination of air-purifying and atmosphere-supplying respirators</u>	<u>Assigned protection factor for type and mode of protection as listed above</u>	

<sup>a</sup> These assigned protection factors apply only in a respiratory protection program that meets the requirements of this Chapter. They are applicable only to airborne radiological hazards and may not be appropriate in circumstances when chemical or other respiratory hazards exist instead of, or in addition to, radioactive hazards. Selection and use of respirators for such circumstances must also comply with the U.S. Department of Labor regulations. Radioactive contaminants for which the concentration values in Table 1, Column 3 of Appendix B of this Chapter are based on internal dose due to inhalation may, in addition, present external exposure hazards at higher concentrations. Under these circumstances limitations on occupancy may have to be governed by external dose limits.

b Air-purifying respirators with APF of less than 100 must be equipped with particulate filters that are at least 95 percent efficient. Air-purifying respirators with APFs equal to 100 must be equipped with particulate filters that are at least 99 percent efficient. Air-purifying respirators with APFs greater than 100 must be equipped with particulate filters that are at least 99.97 percent efficient.

c The licensee may apply to the department for the use of an APF greater than 1 for sorbent cartridges, as protection against airborne radioactive gases and vapors (e.g., radioiodine).

d Licensees may permit individuals to use this type of respirator, who have not been medically screened or fit tested on such respirator, provided that no credit be taken for their use in estimating intake or dose. It is also recognized that it is difficult to perform an effective positive or negative pressure pre-use user seal check on this type of device. All other respiratory protection program requirements listed in LAC 33:XV.442 apply. An assigned protection factor has not been assigned for these devices. However, an APF equal to 10 may be used if the licensee can demonstrate a fit factor of at least 100 by use of a validated or evaluated, qualitative or quantitative fit test.

e Under-chin type only. No distinction is made in this Appendix between elastomeric half-masks with replaceable cartridges and those designed with the filter medium as an integral part of the facepiece (e.g., disposable or reusable disposable). Both types are acceptable so long as the seal area of the latter contains some substantial type of seal-enhancing material such as rubber or plastic, the two or more suspension straps are adjustable, the filter medium is at least 95 percent efficient, and all other requirements of this Chapter are met.

f The assigned protection factors for gases and vapors are not applicable to radioactive contaminants that present an absorption or submersion hazard. For tritium oxide vapor, approximately one-third of the intake occurs by absorption through the skin, so that an overall protection factor of 3 is appropriate when atmosphere-supplying respirators are used to protect against tritium oxide. Exposure to radioactive noble gases is not considered a significant respiratory hazard and protective actions for these contaminants should be based on external (submersion) dose considerations.

g No National Institute for Occupational Safety and Health (NIOSH) approval schedule is currently available for atmosphere supplying suits. This equipment may be used in an acceptable respiratory protection program as long as all the other minimum program requirements, with the exception of fit testing, are met (i.e., LAC 33:XV.442 ).

h The licensee should implement institutional controls to ensure that these devices are not used in areas immediately dangerous to life or health (IDLH).

i This type of respirator may be used as an emergency device in unknown concentrations for protection against inhalation hazards. External radiation hazards and other limitations to permitted exposure, such as skin absorption, shall be taken into account in these circumstances. This device may not be used by any individual who experiences perceptible outward leakage of breathing gas while wearing the device.

AUTHORITY NOTE: Promulgated in accordance with R.S. 30:2001 et seq., and in particular R.S. 30:2104.

HISTORICAL NOTE: Promulgated by the Department of Environmental Quality, Office of Environmental Assessment, Environmental Planning Division, LR 28