OSHA Occupational Safety & Health Administration
U.S. Department of Labor

OSHA Directives

CPL 2-0.120 - Inspection procedures for the Respiratory Protection Standard.

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- **Record Type:** Instruction
- **Directive Number:** CPL 2-0.120
- **Subject:** Inspection procedures for the Respiratory Protection Standard.
- **Information Date:** 09/25/1998

OSHA INSTRUCTION

U.S. DEPARTMENT OF LABOR Occupational Safety and Health Administration

DIRECTIVE NUMBER: CPL 2-0.120	**EFFECTIVE DATE:** September 25, 1998
SUBJECT: Inspection Procedures for the Respiratory Protection Standard	

ABSTRACT

Purpose:	This instruction establishes agency interpretations and enforcement policies, and provides instructions to ensure uniform enforcement of the Respiratory Protection Standard, 29 CFR 1910.134
Scope:	This instruction applies OSHA-wide
References:	OSHA Instruction, CPL 2.103, Field Inspection Reference Manual. OSHA Instruction CPL 2.111, Citation Policy for Paperwork and Written Program Violations 29 CFR 1910.134, Respiratory Protection Standard. NIOSH Respirator Certification Requirements 42 CFR 84 and 30 CFR 11.
Cancellations:	None
State Impact:	See Paragraph V.
Action Offices:	National, Regional and Area Offices
Originating Office:	Directorate of Compliance Programs
Contact:	Office of Health Compliance Assistance (202) 219-8036 200 Constitution Avenue, NW, Room N-3467 Washington, DC 20210

By and Under the Authority of
Charles Jeffress
Assistant Secretary

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CHANGE SCHEDULES GUIDE - A LISTING OF METHODS

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I. **Purpose**. This instruction establishes agency interpretations and enforcement policies, and provides instructions to ensure uniform enforcement of the Respiratory Protection Standard, 29 CFR 1910.134.

II. **Scope**. This instruction applies OSHA-wide.

III. **References**

A. OSHA Instruction, CPL 2.103, Field Inspection Reference Manual, September 26, 1994.
B. OSHA Instruction CPL 2.100, Inspection Procedures for the Permit Required Confined Space Standard, May 5, 1995.
C. OSHA Instruction CPL 2.111, Citation Policy for Paperwork and Written Program Violations, November 27, 1995.
D. OSHA Instruction, CPL 2-2.30, Authorization of Review of Medical Opinions, November 14, 1980.
E. OSHA Instruction, CPL 2-2.32, Authorization of Review of Specific Medical Information, January 19, 1981.
F. OSHA Instruction, CPL 2-2.33, Rules of Agency Practice and Procedure Concerning OSHA Access to Employee Medical Records-Procedures Governing Enforcement Activities, February 8, 1982.
G. OSHA Instruction, CPL 2-2.46, Authorization and Procedures for Reviewing Medical Records, January 5, 1989.
H. OSHA Instruction CPL 2-2.59A, Inspection Procedures for the Hazardous Waste Operations and Emergency Response Standard, April 24, 1998.
I. OSHA Instruction, PER 8-2.4, CSHO Pre-Employment Medical Examinations, March 31, 1989.
J. OSHA Instruction, PER 8-2.5, CSHO Medical Examinations, March 31, 1989.
K. 29 CFR 1910.134, Respiratory Protection Standard.
L. NIOSH Respirator Certification Requirements 42 CFR 84 and 30 CFR 11.
M. 1992 American National Standards Institute (ANSI) Z88.2 Respirator Standard.

IV. **Action**. OSHA Regional Administrators and Area Directors shall use the guidelines in this instruction to ensure uniform enforcement of the Respiratory Protection Standard, 29 CFR 1910.134.

V. **Federal Program Change**. This instruction describes a Federal Program Change for which State adoption is not required. NOTE: In order to effectively enforce safety and health standards, guidance to compliance staff is necessary. Therefore, although adoption of this instruction is not required, States are expected to have standards, enforcement policies and procedures which are at least as effective as those of Federal OSHA.

VI. **Background**. In 1971, OSHA adopted the ANSI standard Z88.2-1969, "Practices for Respiratory Protection," as well as ANSI Standard K13.1-1969, "Identification of Gas Mask Canisters" as its standard for respiratory protection. In April of 1971, OSHA promulgated 29 CFR 1926.103, the initial respiratory protection standard for the construction industry. On February 9, 1979, OSHA announced that 29 CFR 1910.134 would be formally recognized as also being applicable to the construction industry (44 FR 8577).

On November 15, 1994, OSHA issued a Notice of Proposed Rulemaking to revise 29 CFR 1910.134. Public hearings were held in 1995, and the Final Rule was published in the Federal Register on January 8, 1998. The new standard updates the previous standard and incorporates new technology and current scientific knowledge regarding respiratory protection. Application of the requirements of the new standard in affected workplaces will promote more effective use of respirators and provide greater

compliance flexibility. Language in the new standard has been developed to make some requirements in the previous standard more understandable. On April 23, 1998, corrections to the regulatory text were published in the Federal Register.

The new respiratory protection standard also makes the respiratory protection provisions of other health standards consistent with each other and with the final rule. This will make these provisions easier to administer.

The prior Respirator Standard, 1910.134, remains in effect until October 5, 1998, the date when employers must be in compliance with the new standard. On October 5, the prior 1910.134 will be retained, but re-designated as 1910.139. It will apply only to respiratory protection against **M. tuberculosis** (TB) until OSHA has promulgated the final standard for Occupational Exposure to Tuberculosis.

VII. **Inspection Guidelines for the Standard on Respiratory Protection, 29 CFR 1910.134.** These guidelines relate to specific provisions of **29 CFR 1910.134** and are provided to assist compliance officers with conducting inspections where the standard may apply. Any subparagraphs of the standard not discussed in this Directive, should be enforced according to their terms.

A. **Scope and Application**

1. This new standard applies to all respirator usage in General Industry, Shipyards, Marine Terminals, Longshoring and Construction workplaces. It does not apply to agricultural operations or to occupational exposure to **M. tuberculosis.** Respiratory protection against tuberculosis will continue to be enforced under the old 1910.134, which has been redesignated 1910.139.

2. The standard covers respirator use where respirators are being worn to protect employees from exposure to air contaminants above an exposure limit or are otherwise necessary to protect employee health, where respirators are otherwise required to be worn by the employer, and where respirators are voluntarily worn by employees for comfort or other reasons.

B. **Permissible Practice - 1910.134(a)(1) and (a)(2):** Section 134 (a)(1) restates OSHA's longstanding policy that engineering and work practice controls should be the primary means used to reduce employee exposure to toxic chemicals, and that respirators should only be used if engineering or work practice controls are infeasible or while they are being implemented. This preference for engineering and work practice controls is stated in a number of OSHA's substance specific standards (for example, the asbestos standard) and in the standards (29 CFR 1910.1000 and, for construction work, 29 CFR 1926.55) establishing permissible exposure limits for a number of harmful air contaminants. Feasible engineering, administrative or work practice controls must be instituted even though they may not be sufficient to reduce exposure to or below the permissible exposure limit (PEL). They must be used in conjunction with respirators whenever exposures exceed permitted levels.

1. Inspection Guidelines. The compliance officer should determine what engineering controls are in place and what work practices have been instituted to effectively reduce exposure. If controls are in place, but

sampling results indicate these controls have not reduced air contaminant levels to the extent necessary to protect the health of the employee, then the CSHO should determine if the appropriate respirators are being provided and properly used. Even if the employer has not instituted the required engineering controls, failure to provide respirators to protect employees health is citable under 1910.134.

2. Citation Guidelines: In cases where an overexposure to an OSHA Permissible Exposure Limit (PEL), (either an 8-hour time-weighted-average , Ceiling Value, Short Term Exposure Limit or Acceptable Maximum Peak) is exceeded, the following principles apply:

   a. **Violations for Exceeding an Exposure Limit.** Where a PEL is exceeded for a substance listed in Table Z of 1910.1000 or Appendix A of 1926.55, the appropriate paragraph 1910.1000(a) thru (d), or 1926.55(a), should be cited. For substance-specific standards, the appropriate paragraph for exceeding the PEL should be cited.

      Exposures to levels of air contaminants which exceed ACGIH Threshold Limit Values (TLVs) or NIOSH recommended exposure limits (RELs), but which have no OSHA PEL, and which are considered to be serious exposure hazards, should be considered for violations of Section 5(a)(1) of the Act. Guidelines on citing Section 5(a)(1) can be found in the Field Inspection Reference Manual (CPL 2.103 Chapter III).

      Section 5(a)(1) shall not normally be used to impose a stricter requirement than that required by the standard. For example, if the standard provides for a permissible exposure limit (PEL) of 5 ppm, even if data establishes that a 3 ppm level is a recognized hazard, Section 5(a)(1) shall not be cited to require that the 3 ppm level be achieved unless the limits are based on different health effects. If the standard has only a time-weighted average permissible exposure level and the hazard involves exposure above a recognized ceiling level, the Area Director shall consult with the Regional Solicitor.

      NOTE: An exception to this rule may apply if it can be documented that "an employer knows a particular safety or health standard is inadequate to protect his workers against the specific hazard it is intended to address." Such cases shall be subject to pre-citation review.

      Section 5(a)(1) violations of the Act should be cited so as to cover all aspects of a serious hazard for which no standard exists. Related violations of the respirator or other standards should be grouped with any Section 5(a)(1) violations.

   b. **Engineering and Administrative Controls**. An employer's failure to implement feasible engineering or work practice controls should be cited under an applicable provision of a substance-specific standard (for example, section 1910.1000(f) of the general industry

asbestos standard) or, for those substances listed in 1910.1000 or 1926.55, under 1910.1000(e) or 1926.55(b). The requirement to implement feasible engineering and administrative controls is in several substance-specific standards (for example, section 1910.1001(f) of the asbestos standard). These violations should normally be grouped with the overexposure. Section 1910.134 (a)(1) should not be cited along with 1910.1000(e) or 1926.55(b). Section 1910.134(a)(1) should not be cited when an employer fails to use engineering or work practice controls to reduce exposures to chemicals for which OSHA has not established permissible exposure limits. In appropriate circumstances, an employer's failure to use feasible engineering or work practice controls when there is no OSHA PEL may be citable under 5(a)(1) of the Act.

c. **The Requirement to Provide Respirators**. Whether or not an employer has instituted required engineering or work practice controls, the employer's failure to provide respirators when employees are exposed to hazardous levels of air contaminants is citable under 1910.134. The requirement to provide respirators is found in several substance-specific standards (for example, 1910.1025(e) and (f) of the general industry lead standard). In cases involving those standards, where respirators have not been provided, the section of the substance-specific standard requiring respirators should be cited. If the substance is listed only in Table Z, the violation for not providing a respirator should be cited 1910.134(a)(2). These violations also would normally be grouped with the overexposure.

   The employer must provide the right type of respirator for the substance and level of exposure involved. If the employer provided the wrong kind of respirator, a citation should be issued under paragraph (d) for not providing an **appropriate** respirator, unless a substance specific standard is applicable.

d. **The Requirement to Ensure the Use of Respirators.** Where respirators are needed to protect the health of the employees, employers must not only provide respirators but ensure that employees use them. In cases involving substance-specific standards, the section of the standard requiring respirator use should be cited when employers have not ensured respirator use. If the substance is only listed in Table Z (1910.1000) or Appendix A (1926.55), citations for not ensuring respirator use should be cited under 1910.1000(e) or 1926.55(b). For substances not listed in 1910.1000, 1926.55, or substance-specific standards, 1910.134(a)(1) should be cited when the employer fails to ensure respirator use.

e. **The Requirement to Have a Program.** Paragraph (a)(2) requires the employer to establish and maintain a respiratory protection program that includes the requirements in 1910.134(c) whenever respirators are required to protect the health of the employee. The program must be in writing and contain all of the elements specified in 1910.134(c). If the employer has no program at all (i.e., no

elements of a respirator program in place), a citation for violation of .134 (a)(2) should be issued. If respirators are used or other respirator violations are found, and there is no written program, then those violations and .134(c)(1) should be cited. If an employer has a written program, but an element required by .134(c) is omitted, then the subsection of .134(c) that requires the missing element should be cited.

The specific actions that the employer must take are in 1910.134(d)-(m). If the employer's written program has all of the required elements, but the employer has not taken one of the actions required in .134(d)-(m), cite the applicable paragraph in .134(d)-(m). If no written program exists, but all other provisions of the standard have been met, a violation for lack of a written program would normally not be cited. CPL 2.111, Citation Policy for Paperwork and Written Programs, should be reviewed for guidance before citing the written program.

C. **Definitions-1910.134(b):** The revised standard now contains definitions in paragraph (b) that provide a clearer understanding of specific terminology used in the standard and how these terms are applied to respirators and their use. Some definitions in the proposal were not included in the final standard, and some new definitions were added.

1. **"Adequate warning properties"** was not included in the final standard because the two major warning properties, odor and irritation, are unreliable or otherwise inappropriate to be used as primary indicators of sorbent exhaustion.

2. **"Assigned Protection Factor"** has not yet been included in the standard. OSHA is conducting further rulemaking on this issue, and will eventually add the APFs to the final standard. In the interim, OSHA will continue to refer to NIOSH APFs except in cases where APFs have been published in substance-specific standards or are addressed by OSHA in separate letters of interpretation. Employers must rely on the best available information when selecting the appropriate respirator.

3. **"Filtering facepiece"** (dust mask) means 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. Whenever a filtering facepiece is used to meet the requirements of the standard, it must be NIOSH approved.

4. A "**HEPA filter**"(High Efficiency Particulate Air) is a filter that is 99.97% efficient in removing monodispersed particles of 0.3 micrometers in diameter. NIOSH no longer uses this term in its new respirator certification standard (42 CFR 84). However, OSHA has retained this definition because it is used in many of the existing substance-specific standards. When HEPA filters are required by an OSHA standard, N100, R100, and P100 filters can be used to replace them.

Note: NIOSH Respirator Certification Requirements, 30 CFR 11

(Part 11) were replaced by 42 CFR 84 (Part 84) on July 10, 1995. Only certifications of non-powered, air-purifying, particulate-filter respirators were affected by this change. The remaining portions of Part 11 were incorporated into Part 84 without change. Part 84 permitted the manufacture and sale of non-powered-particulate respirators certified under Part 11 until July 10, 1998.

Distributors who have purchased these respirators will be able to sell them until their inventories are depleted. Employers may continue to purchase available products and will be permitted to use them until their inventories are depleted, or until the shelf or service life for the product expires. However, Dust/Mist and Dust/Mist/Fume Filters may only be used for particulates with mass median aerodynamic diameters (MMAD) of least 2 micrometers, in accordance with paragraph (d)(3)(iv)(C). Welding fumes and silica flour may be examples of dust particulates that are less than 2 micrometers. If the MMAD cannot be determined, a HEPA filter, or a filter certified by NIOSH under 42 CFR 84 (N95 or higher) must be selected.

D. **Respiratory Protection Program-1910.134(c)(1):** A written respiratory protection program is required when necessary to protect the health of the employee from workplace contaminants or when the employer requires the use of respirators. A limited written program is also required when respirators (other than filtering facepieces) are being voluntarily worn by employees. The program must include workplace specific procedures and contain all applicable program elements. Where respirators are required, respirators (and their associated requirements such as fit-testing and maintenance), training and medical evaluations must be provided at no cost to the employee. It is the intent of the standard that the employer would not be required to incur any costs associated with voluntary use of filtering facepieces other than providing a copy of Appendix D to each user. If employers allow the voluntary use of respirators other than filtering facepieces, the costs associated with ensuring the respirator itself does not create a hazard, such as medical evaluations and maintenance must be provided at no cost to the employee.

1. Inspection Guidelines. During inspections of workplaces where respirators are used, the CSHO is to evaluate the respiratory program and determine if the employer's written program is adequate and complete for that particular site.

   The program must be tailored to cover the specific work operations and practices in the workplace. The provisions listed in paragraph (c)(1)(i) thru (ix) of the standard must be included in the written program unless it is determined they are not applicable.

   These provisions are to be considered when evaluating a written program:

   a. **(i)** procedures for selecting respirators
   b. **(ii**) medical evaluations for users,
   c. **(iii)** fit-testing procedures for tight-fitting respirators,
   d. **(iv)** procedures for proper use during routine and emergency

situations,

e. **(v)** procedures for cleaning, storing, disinfecting, etc.,
f. **(vi)** procedures to ensure adequate air quality and flow for atmosphere-supplying respirators
g. **(vii)** training on respiratory hazards,
h. **(viii)** training on proper use, donning and removing the respiratoretc.,
i. **(ix)** procedures for regularly evaluating the effectiveness of the program.

Compliance with the program should be verified during the walkaround by personal observation and employee interviews.

2. Citation Guidelines. If respirators are required to be worn in the workplace or respirators other than dust masks are worn by voluntary users, a written program is required. An overexposure is not required to cite this paragraph. If the CSHO determines that specific provisions are lacking or deficient in the written program, the CSHO should cite section (c)(1) with the specific element(s) that are missing. Discrepancies between the written program and implemented work practices at the worksite should be cited by the appropriate paragraph in the standard that requires the work practice. If overexposures are found and no program at all exists, paragraph (a)(2) should be cited.

3. (c)(2) Voluntary Use: Normally, respirators that are voluntarily used by employees will be filtering facepieces (dust masks). NIOSH-approved respirators are strongly recommended, but they are not required for voluntary use. This voluntary use of dust masks alone does not require the employer to have a written program. For filtering facepiece respirator use, the employer needs only ensure that dust masks are not dirty or contaminated, that their use does not interfere with the employee's ability to work safely, and that a copy of Appendix D is provided to each voluntary wearer. Merely posting Appendix D is not considered adequate.

   Use of elastomeric or supplied-air respirators, even when voluntary on the part of the employee, will require the employer to include all elements in a written program that will ensure use of these respirators does not create a hazard.

4. Inspection Guidelines Even though employees may be voluntarily using respirators, adverse health conditions can be caused by the wearing of a respirator itself. Examples include, but are not limited to;

   a. (1) an employee's health being jeopardized by the wearing of a respirator (e.g., employee has a cardiac and/or pulmonary disorder that could be aggravated by respirator use),

   b. (2) the wearing of a dirty respirator that can cause dermatitis or ingestion of a hazardous chemical;

   c. (3) the sharing of a respirator that leads to transmittal of disease.

5. Citation Guidelines Maintenance (h) and medical evaluation (e) violations should be considered for all situations where employees have elected to use a respirator, other than a dust mask, for personal comfort. If overexposures are found, then all other applicable subparagraphs should be cited.

6. (c)(3) Program Administrator: A "respiratory protection program administrator" is required to oversee and evaluate the respirator program. This individual must be suitably trained and have the appropriate accountability and responsibility to manage the full respiratory protection program.

   Companies with multiple worksites may have a program administrator at each worksite, as long as this person is qualified and retains the accountability and responsibility for the day-to-day operation of the specific program for that site. Alternatively, a company may opt to have one program administrator for several sites and/or one program for several similar sites as long as the program contains the necessary elements and addresses the hazards at those sites.

7. Inspection Guidelines. The extent of training or experience required for the program administrator will vary based on the complexity of the respiratory hazards in the workplace. Where significant program deficiencies are discovered, compliance officers should discuss questions about the program with the program administrator to determine how familiar she or he is with respirators, the hazards in the workplace, respirator use in the facility, the respirator standard and the company's respirator program.

E. **Selection of Respirators and Hazard Evaluation-1910.134(d):** The employer is required to select and provide an appropriate respirator (NIOSH certified) based on the respiratory hazard(s) present in the workplace. The employer must identify hazardous airborne contaminants that employees may inhale and make a reasonable estimate of employee exposures in determining the appropriate respirator for employees to use. Oxygen deficient atmospheres and those atmospheres that are not or cannot be estimated must be treated as IDLH environments. Where a contaminant is regulated by a substance-specific standard that requires monitoring, failure to monitor in accordance with the standard's terms would be cited under that standard. For other contaminants, although the most reliable and accurate method to determine exposure is to conduct personal air monitoring, it is not explicitly required by the respirator standard. Instead, other means can be used to estimate workplace exposures. Acceptable means include:

   - Use of objective data - this is the use of data obtained from industry studies, trade associations, or from tests conducted by chemical manufacturers which demonstrate that air contaminants cannot be released in the workplace in airborne concentrations that are IDLH. The objective data shall represent the highest contaminant exposures likely to occur under reasonably foreseeable conditions of processing, use, or handling. The employer must document the use of objective data as part of their written program.

- Application of mathematical approaches - the preamble to the final rule (p. 1199) states that employers can use data on the physical and chemical properties of air contaminants, combined with information on room dimensions, air exchange rates, contaminant release rates, and other pertinent data including exposure patterns and work practices to estimate the maximum exposure that could be anticipated in the workplace.

- As a continuing practice, employers are required to identify hazards as a result of changes in the workplace such as a change in equipment, process, products, or control measures that could result in new exposures. Appropriate respirators should be provided as necessary.

1. Inspection Guidelines. The CSHO should closely scrutinize the employer's estimate of employee exposure and determine if the hazard assessment is based on appropriate data and reliable information. OSHA personnel have considerable experience evaluating air monitoring data for representativeness of the sample and reliability and accuracy of data. Where objective data are used in the workplace to determine employee exposure, the data must have been obtained under conditions which closely resemble the process, types of materials, control methods, work practices, and environmental conditions.

   In regards to mathematical predictive equations, their use should be limited to situations where workplace factors, such as contaminant release and ventilation system performance, are fairly constant over the work shift and predictable. The results should incorporate reasonable safety factors and be interpreted conservatively. CSHO's must exercise a great deal of professional judgement in concluding if the mathematical approach provides appropriate guidance. (e.g., The methylene chloride standard forbids the use of APR's for protection against methylene chloride and would supercede any model which predicts a changeout time for this chemical.)

   The CSHO should examine the employer's Hazard Communication Program for further information on existing respiratory hazards in the workplace.

   The Hazard Communication Standard requires employers to inventory the hazardous chemicals in their workplace and to maintain copies of material safety data sheets (MSDS) for each hazardous chemical. In a similar manner under the respirator standard, the employer must examine the workplace and determine if the quantity, circumstances, and use of the hazardous chemicals require further evaluation for respiratory hazards. MSDSs contain information such as physical and chemical characteristics and hazards, primary route(s) of entry, and generally applicable control measures. Some MSDSs include some recommendations on appropriate respiratory protection.

   For those chemicals that do present a potential respiratory hazard, employers can contact the chemical manufacturer for additional information on predicted exposure levels and methods to further control worker exposure.

The CSHO should be aware of the potential for an emergency situation and the type of respirators selected. The employer must provide the appropriate emergency escape respirator in the immediate work area for employee use and address emergency use respirators in the written respirator program.

The CSHO should also investigate, through routine employee interviews, what actions the employer has taken to re-evaluate employee exposure when employees have made health complaints to determine if appropriate action has been taken to address a respiratory hazard.

Respirators required to be used in the workplace must be NIOSH-approved and appropriate for the hazard. Part 84 respirators with an "N" designation should not be used in work settings where oil aerosols are generated, while those with an "R" designation should be used for only one shift when oil is present. Respirators with a "P" designation may be used for more than one work shift, even when oil is present. Employers must follow respirator manufacturer's recommendations.

2. Citation Guidelines. If the employer has not made any effort to assess the respiratory hazards, and there is potential for an overexposure, the CSHO should cite section (d)(1)(iii). The extent to which the employer explored ways to reasonably estimate exposures must be evaluated at each worksite.

   Inappropriate respirators [(d)(1)(i)] should be cited when the CSHO documents an overexposure is possible, and a suitable respirator is not being used for protection against that exposure . Unapproved [(d)(1)(ii)] respirators can be cited even where an overexposure has not been established.

3. (d)(3)(iii)(B) Air-purifying Respirators for Protection Against Gases and Vapors on Atmospheres That Are Not IDLH - If a cartridge/canister air purifying respirator for the protection against gases and vapors does not have an ESLI, then the employer must implement a cartridge/canister change schedule based on objective information that will ensure the cartridges/canisters are changed before the end of their service life. The purpose of a change schedule is to establish the time period for replacing respirator cartridges and canisters; this is critical to preventing contaminants from respirator breakthrough, and thereby over-exposing workers. Data and information relied upon to establish the schedule must be included in the respirator program. The requirements for several of OSHA's chemical specific standards already address this issue and have been retained. These include:

a. Acrylonitrile 1910.1045(h)(2)(ii)	end-of-service life or end of shift (whichever occurs first)
b. Benzene 1910.1028(g)(2)(ii)	end-of-service life or beginning of shift (whichever occurs first)
c. Butadiene 1910.1051 (h)(2)(ii)	every 1, 2 or 4 hours dependent on concentration according to Table 1 and at beginning of each shift
d. Formaldehyde 1910.1048 (g)(2)(ii) -	for cartridges every three hours or end of shift (whichever is sooner); for canisters, every 2 or 4 hours according to the schedule in (g)(3)(iv)
e. Vinyl chloride 1910.1017(g)(3)(ii)	end-of-service life or end of shift in which they are first used (whichever occurs first)
f. Methylene chloride - 1910.1052 (g)(2)(ii)	canisters may only be used for emergency escape and must be replaced after use.

Change schedules for all other gases and vapors must be established and implemented by the employer. OSHA has stated in the preamble to the final rule that the employer is not required to research and analyze experimental breakthrough data, but may obtain information from sources who have expertise and knowledge that can help the employer to develop reasonable change schedules. The new standard prohibits the use of warning properties as the sole basis for determining change schedules. However respirator users should be trained to understand that abnormal odor or irritation is evidence that respirator cartridges need to be replaced. Where an effective change schedule is implemented, air-purifying gas and vapor respirators may be used for hazardous chemicals, including those with few or no warning properties.

4. Inspection Guidelines - OSHA understands that new or existing objective data could be presented in a variety of formats and from a number of different sources. CSHOs should approach the evaluation of this requirement with professional judgement and flexibility. There are a number of factors that influence the service life of a cartridge. Some of the more significant factors include: the contaminant's chemical properties, temperature, humidity, contaminant concentration, work rate (breathing rate) of the respirator user, variability of respirator cartridges between manufacturers, and the presence of multiple contaminants. To ensure fair and reasonable enforcement of this provision, the following guidelines are presented to assist the CSHO in determining compliance with this

provision.

a. Availability of Objective Data: Ascertain if there are sources of objective data for the particular make and model of the respirator cartridge/canister and if this data is sufficient to implement change schedules. Typical sources would include: respirator manufacturers, industry organizations, trade associations, professional societies, chemical manufacturers (MSDS), academic institutions, and ad hoc committees. The CSHO should determine if the employer has access to adequate information to comply with this provision. For a list of some options that employers may use in developing their change schedules, refer to Appendix A.

b. Use of Inappropriate Respirator Cartridge/canister: Determine if the air purifying respirator is appropriate for the contaminant present in the workplace. In some cases, the breakthrough time may be so rapid (minutes) that air purifying respirators are not feasible and supplied air respirators should be used. CSHOs should consult respirator manufacturers and other reference material for this information.

c. Change Schedules For Mixtures: Establishing cartridge service life for mixtures of contaminants is a complex task and one that requires considerable professional judgement to create a reasonable change schedule. Cartridge service life for mixtures is best determined using experimental methods. Change schedules are very difficult to develop for mixtures using predictive mathematical models.

   The change schedule for a mixture should be based on reasonable assumptions that include a margin of safety for the worker wearing the respirator. Where the individual compounds in the mixture have similar breakthrough times (i.e. within one order of magnitude), service life of the cartridge should be established assuming the mixture stream behaves as a pure system of the most rapidly migrating component or compound with the shortest breakthrough time (i.e., sum up the concentration of the components). Where the individual compounds in the mixture vary by 2 orders of magnitude or greater, the service life may be based on the contaminant with the shortest breakthrough time. OSHA believes that an approach such as this reflects good health and safety practice where neither objective or experimental data is available for the mixture.

   OSHA believes that change schedule information will become more available to the respirator user community and will evolve in quality. The CSHO should review the written respiratory protection program to ensure that it describes the information and data relied upon and the basis for the canister and cartridge change schedule and the basis for reliance on the data as required by the standard. Again, CSHOs should exercise judgement in evaluating mathematical models, rules of thumb, experimental data, use of analogous chemical structures, and other reasoned approaches.

d. Chemical Contaminant Migration: CSHO's should be aware that some contaminants have a tendency to migrate through cartridge/canister sorbent material during periods of storage or non-use. This is characteristic of the contaminant-carbon bed interaction for organic chemicals with boiling points below 65 Centigrade and would predictably shorten breakthrough times. In cases where respirators are used for multiple days this could present an additional exposure to the respirator user. Where contaminant migration is possible, respirator cartridges/canisters should be changed after every workshift where exposure occurs unless the employer has specific objective data to the contrary (desorption studies) showing the performance of the cartridge in the conditions and schedule of use/non-use found in the workplace.

5. Citation Guidelines. If the employer has or could have had the knowledge available to implement change schedules and had done little or nothing to determine accurate change schedules, (d)(3)(iii)(B) should be cited. For citation purposes, the CSHO should document the purpose of respirator use, make and model of respirator(s), identification and concentration of contaminant (s), duration of use, exposure to a mixture of contaminants and any other relevant user and workplace factors.

F. **Medical Evaluation - 1910.134(e)**: Employers must provide a medical evaluation to determine each employee's fitness to wear a respirator. The evaluation must be provided before the initial fit-testing and before the respirator is used for the first time. Medical evaluations consist of the administration of a medical questionnaire, which is found in the mandatory Appendix C of the standard, or provision of a physical examination that elicits the same information as the questionnaire for the employee. An employer, who opts to provide physical examinations to his or her employees, need not also administer the medical questionnaire. These evaluations are required for **all** respirator users except for employees who voluntarily use dusts masks and for those whose only respirator would be the use of escape-only respirators. SCBA's are not considered escape-only respirators. Employees who refuse to be medically evaluated cannot be assigned to work in areas where they are required to wear a respirator.

Where employers use a transient workforce, (e.g., temporary or construction workers), the employer may accept the written medical recommendation of the employee's ability to use a respirator as determined by their previous employer's PLCHP only if the work conditions and type and weight of the respirator remains the same and appropriate for use at their new work site. In this situation, the employer must obtain from the previous employer a copy of the PLCHPs written recommendation.

Section (e)(2)(ii) requires the employer to obtain the information required in the questionnaire or provide the initial examination prior to performing fit testing of employees and prior to requiring the employee to wear the respirator in the workplace. When using the questionnaire, the employer may not change the wording of questions in Part A , if the form is being used as the sole means to evaluate employees. The Physician or other Licensed Health Care Professional (PLHCP) may add questions to the questionnaire that could assist in determining

whether the employee can perform the work while wearing respiratory protection.

In order to maintain strict confidentiality of the information obtained in the questionnaire, the employer's role is limited to distributing the blank questionnaire to the employee for him or her to fill out, or providing it to the PLHCP, who will administer the questionnaire to the employee. If the employer provides the questionnaire to the employee, an addressed and postage-paid envelope should also be provided for the employee to mail it to the PLHCP. The questionnaire and findings may also be maintained by the employer's medical office, if the health office is administratively separate from the employer's central administration offices.

If the employer does not have or chooses not to use an in-house medical staff, arrangements must be made for a physician or other licensed healthcare professional (PLHCP) to perform the medical evaluations. The PLHCP may be a physician, a registered nurse, a nurse practitioner, a physician assistant, or other licensed health care professional acting within the scope of his or her state license, registration, or certification. The PLCHP must be legally permitted by his or her professional license to conduct the type of medical evaluation required by the respirator standard. Scope of practice for non-physician PLCHPs will vary from state to state. All PLCHPs who participate in any aspect of the medical evaluation must be practicing within the scope of their license. For assistance in determining which state licensing board or agency to contact to determine a PLCHP's legally permitted scope of practice, the CSHO can contact the Directorate of Technical Support in OSHA's National Office.

The employer must ensure that the questionnaire is administered in such a manner that employees can understand the content and the confidentiality of the record is maintained. Where the employee cannot understand English, the employer must have the questionnaire translated into the employee's language either through a translator or a translated written copy. The questionnaire has been translated into Spanish and is available on OSHA's homepage (www.osha.gov) in the Respirator Q & A Document. In cases where the employee cannot read, the employee can request someone other than the employer to orally read them the questionnaire or the PLHCP may obtain through an interview or examination the same information requested on the medical questionnaire.

1. Inspection Guidelines. The CSHO should determine if the requirements of paragraph (e) are being met by interviewing a number of employees and asking if they have been provided with a confidential evaluation of their ability to wear a respirator, either by the administration of the medical questionnaire or by physical examination. Compliance officers should determine what mechanism the employer is using to ensure that the employer does not see the answers to the questionnaire in order to maintain confidentiality. The CSHO can verify that these medical evaluations have in fact been conducted by asking the employer to see the written recommendation of the employee's ability to use a respirator. The employee should have also received a copy. The recommendation must contain only the information required by subparagraph (e)(6).

The CSHO should determine what supplemental information was given to the PLHCP by the employer. This can be done through interviewing the PLHCP or reviewing documentation from the employer. If the employer is relying on a medical evaluation for the employee from a previous employer (which is allowed only when the employer uses a transient workforce), the CSHO should determine that the work conditions and respirator remained the same.

If the CSHO suspects the employee(s) did not receive a medical evaluation or have not answered the questionnaire honestly (e.g., been "coached" by the employer on how to respond to the mandatory questions from Appendix C), then the CSHO should ask to interview the PLHCP. If this interview still results in questions, the CSHO may wish to obtain a Medical Access Order and review the actual medical questionnaire and/or the physical examination records where necessitated by this paragraph of the rule.

The CSHO should also ensure that any required physical examinations have in fact been conducted, as per (e)(3) and (e)(7). A positive answer to any question in Part A, Section 2, Questions 1-8 (also questions 10-15 for SCBA and full-face respirator users) requires a follow-up by the PLCHP. The PLCHP may evaluate positive responses through consultation with the employee to determine if the positive response is not relevant to the employee's ability to wear a respirator or if further physical examination is necessary (e.g., brief smoking history in the past, as compared to current heavy smoker status).

If questions arise regarding the issue of qualifications of the PLHCP, the CSHO should inquire with the state licensing board or the applicable registration or certification agencies in that state to ensure that the PLCHP is acting within the scope of his or her practice.

2. Citation Guidelines: If medical evaluations are not provided, a violation of (e)(1) exists. If the PLHCP designated by the employer is not operating within the scope of their license or their license has expired or is invalid, the employer should be cited under paragraph (e)(2)(i) for choosing an inappropriate PLHCP.

    a. If the employer's medical evaluation does not obtain the mandatory information required in Part A, Sections 1 and 2 of Appendix C, then a violation of (e)(2)(ii) exists.

    b. If the PLHCP is not provided with the appropriate supplemental information, a violation of (e)(5) exists.

G. **Fit Testing-1910.134(f):** Fit testing is required for all employees using negative or positive pressure tight-fitting respirators, where such respirators are required by OSHA or where the employer requires the use of such a respirator. A fit test is not required for voluntary users or for escape-only respirators.

The fit test must be performed before the respirator is used in the workplace. It must be repeated at least annually and whenever a different respirator facepiece

is used or a change in the employee's physical condition could affect respirator fit. If the respirator subsequently becomes unacceptable (i.e., causes irritation or pain to the employee) to the employee, the employee must be given the opportunity to select a different respirator facepiece and be retested.

Qualitative Fit-Testing (QLFT) may be used to fit test negative pressure air-purifying respirators, if they will only be used in atmospheres less than ten times the PEL, since existing evidence only validates the QLFT protocols listed in Appendix A to identify respirators that achieve a fit factor of 100. For greater concentrations, Quantitative Fit-Testing (QNFT) must be used. When quantitative fit-testing is used, **all** full-facepiece respirators must meet or exceed a fit factor of 500, while quarter - and half-mask respirators must meet or exceed 100. For all positive pressure, atmosphere-supplying respirators, either qualitative or quantitative fit testing may be used. While atmosphere-supplying respirators are fit-tested in the negative pressure mode, these respirators are most often used as positive pressure respirators in the workplace. Positive pressure atmosphere-supplying respirators that pass the QLFT or QNFT fit test may be used at the higher protection factors assigned these respirators. See Table 1 for a summary.

1. Inspection Guidelines. The CSHO should determine which protocol was used for fit testing and if all employees who are wearing tight-fitting respirators have been fit-tested in the last twelve months for the respirator they are wearing. Fit testing procedures should be discussed with the program administrator. If fit testing is being performed, the CSHO should observe the company's procedures and evaluate their adherence to the prescribed protocol.

    a. Where employees move from job to job within the year (e.g., temporary or construction workers), their fit test need not be repeated, if the employer obtains a copy of the original fit test record and the same respirator make, model and size is available and appropriate for use at their new work site.

2. Citation Guidelines. Fit test records should be reviewed. If no fit test record is found it must be determined if they were not maintained [(m)(2)(ii)] or the test was not performed [(f)(2)] and cited accordingly. For not following prescribed protocol, cite (f)(5). Using QLFT for negative pressure APR's used in atmospheres greater than 10 times the PEL would be cited as (f)(6).

    a. If fit testing was done by a previous employer within the required time, but no fit test record was obtained by the current employer, a citation for (m)(2) should be issued.

    b. If the CSHO determines the fit testing was not appropriate for the present respirator usage, citations for the appropriate requirements of paragraph (f) should be issued.

Table 1

Acceptable Fit-Testing Methods

	QLFT	QNFT
Half-Face, Negative Pressure, APR (<100 fit factor)	Yes	Yes
Full-Face, Negative Pressure, APR (<100 fit factor) used in atmospheres up to 10 times the PEL	Yes	Yes
Full-Face, Negative Pressure, APR (>100 fit factor)	No	Yes
PAPR	Yes	Yes
Supplied-Air Respirators (SAR), or SCBA used in Negative Pressure (Demand Mode) (>100 fit factor)	No	Yes
Supplied-Air Respirators (SAR), or SCBA used in Positive Pressure (Pressure Demand Mode)	Yes	Yes
SCBA - Structural Fire Fighting, Positive Pressure	Yes	Yes
SCBA/SAR - IDLH, Positive Pressure	Yes	Yes
Mouthbit Respirators	Fit-testing Not Required	
Loose-fitting Respirators (e.g., hoods, helmets)		

H. **Use of Respirators - 1910.134(g):** Employers must establish and implement procedures for the proper use of respirators. These procedures include prohibiting conditions that may result in facepiece leakage, preventing employees from removing respirators in hazardous environments, ensuring continued respirator operation throughout the shift, and establishing procedures for the use of respirators in IDLH atmospheres.

1. Facepiece Seal Protection (g)(1):

a. Inspection Guidelines - The CSHO should be alert for the presence of facial hair (more than one day's growth) that comes between the sealing surface of the respirator and the face as well as other conditions that could result in facepiece seal leakage or interfere with valve function of tight-fitting respirators, such as the presence of facial scars, the wearing of jewelry, or the use of headgear that projects under the facepiece seal. Corrective glasses or goggles or other personal protective equipment (such as faceshields, protective clothing, and helmets) must not interfere with the seal of the facepiece to the face of the user. If employees wear other safety equipment with their respirators, the employee must pass an appropriate fit test while wearing the equipment to determine if it interferes with the seal.

Employees should be observed to determine if the seal check procedures are being performed each time the respirator is donned. The procedure used must be one listed in Appendix B-1 or recommended by the manufacturer if the employer demonstrates it is as effective as those listed in Appendix B-1. Alternative seal checks must be based on scientific studies. [The face fit is considered satisfactory if a slight positive pressure can be built up inside the

facepiece when the exhalation valve or surface is covered, the user exhales gently, and there is no evidence of outward leakage at the seal. The negative check requires covering the inlet opening or surface, inhaling gently, and having the facepiece remain in a slightly collapsed condition with no inward leakage of air detected.]

b. Citation Guidelines - CSHO should cite (g)(1)(i)(A) when employees' facial hair comes between the sealing surface of the facepiece and the face or interferes with valve function; (g)(1)(i)(B) when any other condition except for those listed in (g)(1)(ii) interferes with the face-to-facepiece seal; (g)(1)(ii) when the employee is wearing equipment (e.g., glasses, goggles, helmets, etc.) that affects the face-to-facepiece seal, but was not worn during fit testing; (g)(1)(iii) if user seal checking is not being performed or the employer has not demonstrated that the procedures used are those listed in or as effective as those in Appendix B-1. This paragraph should not be cited in voluntary use situations, if overexposures are not found.

2. Continuing Respirator Effectiveness (g)(2):

a. Inspection Guidelines - The employer is required, by paragraph (c)(1)(ix), to address in its written program the type of regular surveillance of the workplace necessary to evaluate the effectiveness of the respirator program. The surveillance procedures may include continuous or periodic monitoring, on-site observations, and notation of problems. The intensity of the surveillance should be tailored to the hazards present in the workplace. Highly hazardous substances that pose acute respiratory hazards merit a higher degree of surveillance.

Section (g)(2)(ii) requires that employers ensure that employees leave the respirator-use area to correct certain problems associated with respirator use, including the detection of contaminant breakthrough, and to replace the respirator or its filters or cartridges. Employees should be interviewed [e.g., What do you do if you notice a leak?] to determine whether there are any policies or actions which would prohibit or impede them from leaving the area should they have significant problems with their respirators or which impede the replacing of filters or cartridges. Paragraph (g)(2)(iii) is designed to prevent employees from reentering a workplace after leaving because of a significant respirator failure without first assuring the proper functioning of the respirator.

b. Citation Guidelines - The CSHO should cite (c)(1)(ix) if the written procedures are inadequate to identify problems or changes; (g)(2)(i) if the routine surveillance of the work conditions is not performed; the appropriate section of (g)(2)(ii)(A), (B) or (C), if prohibitions to leaving an area are identified or if employees fail to leave the area when the standard requires them to do so; (g)(2)(iii) if employees are allowed back into an area before the employer has replaced or repaired the respirator.

3. Procedures for IDLH Atmospheres (g)(3):

   a. Inspection Guidelines - The employer must be prepared for emergency rescue or respirator failure whenever employee(s) are working inside of an IDLH atmosphere. At least one person must be on standby outside the IDLH atmosphere and maintain communication with the person inside at all times. The standby person(s) must be trained and equipped to provide an effective emergency rescue. Except in emergency situations, environments containing IDLH atmospheres are frequently well enough characterized and controlled that a single standby person can monitor the status of multiple entrants. The need for multiple standbys should be evaluated in context with the ability of the standby personnel to meet all their standby duties, including their ability to monitor the worker(s) in the area and their ability to initiate effective rescue procedures. Planning is critical for effective response to emergency situations through the development of specific emergency procedures. These procedures should address how the employer will be notified when standby person(s) outside of the IDLH atmosphere enter the IDLH atmosphere to provide emergency rescue and what actions will be taken or assistance provided by the employer. Emergency procedures must be developed and included in the employer's written respirator program.

      For work performed outside of visual contact, voice, radio or signal line are permitted. CSHOs should specifically review protocols for communication, rescue, and notification for employees entering IDLH atmospheres. Communication protocols must be established that allow the standby person to monitor entrant status and enable the standby(s) to alert entrants of the need to evacuate the area. It is not sufficient to rely on the employees in the IDLH area to call for help when needed.

      Paragraph (g)(3) does not apply to IDLH atmospheres in a permit-required confined space (PRCS) or to environments in which there is an uncontrolled release of a hazardous substance. IDLH atmospheres in a PRCS are specifically addressed in the PRCS standard, 1910.146, and its accompanying directive, CPL 2.100. Environments in which there is an emergency release of a hazardous substance are addressed in paragraph (q) of OSHA's HAZWOPER standard, 1910.120 or 1926.65, and its accompanying directive, CPL 2-2.59A. In facilities where an uncontrolled release of a hazardous substance could create an emergency IDLH atmosphere, employers must follow the requirements of HAZWOPER paragraph (q). These situations must be addressed in the employer's emergency response plan and the response procedures must be consistent with that standard.

   b. Citation Guidelines - If an IDLH area meets the definition of a confined space, then the requirements of 1910.146 would apply and

the appropriate section of 1910.146 should be cited where deficiencies are noted. If the IDLH is a result of an uncontrolled release of a hazardous substance, then the appropriate section of the HAZWOPER standard, 1910.120 should be cited. Otherwise, violations should be cited under the applicable subparagraph of (g)(3). If adequate communication is not maintained between the entrants and the standby personnel located outside the IDLH area, (g)(3)(ii) should be cited.

4. Procedures for Interior Structural Firefighting, 1910.134(g)(4): This section applies to private sector workers engaged in firefighting, including those working in industrial fire brigades and private incorporated fire companies, and to Federal employees under Section 19 of the Act. These or equivalent provisions apply to State and local government firefighters only in the 25 States that operate OSHA-approved State plans which are required to adopt an identical or "at least as effective" standard and extend its coverage to public employees. (Coverage of volunteer firefighters in these States varies by State and depends on State law.) The following guidance will have applicability primarily in the State Plan States and in responding to general inquiries.

   The provision is limited to workers performing an interior attack on an interior structural fire. In Subpart L (1910.155), OSHA has defined "interior structural fire fighting" to mean: "the physical activity of fire suppression, rescue or both, inside of buildings or enclosed structures which are beyond the incipient stage." This is firefighting to control or extinguish a fire in an advanced stage of burning, producing large amounts of smoke, heat and toxic products of combustion. Firefighter exposure during this activity is extremely hazardous. The atmosphere is considered IDLH and the use of Self Contained Breathing Apparatus is required. By contrast, incipient stage fire fighting involves the control or extinguishment of a fire in the initial or beginning stage, using portable fire extinguishers or small hose lines without the need for personal protective equipment. It is the incident commander’s responsibility, based on training and experience, to judge whether a fire is an interior structural fire, and how it will be attacked.

   OSHA has discussed this provision in a number of documents.

   a. Summarized below are some key points from those documents.

      - There must always be at least two firefighters stationed outside during interior structural firefighting, and they must be trained, equipped and prepared to enter if necessary to rescue the firefighters inside. However, the incident commander has the responsibility and flexibility to determine when more than two outside firefighters are necessary given the circumstances of the fire. The two-in/two-out rule does not require an arithmetic progression for every firefighter inside, i.e. the rule should not be interpreted as 4-in-4-out, 8-in-8-out, etc.

      - It is important that the CSHO recognize that life-saving

activities in interior structural fire fighting are not precluded by the standard. There is an explicit exemption in the standard that if life is in jeopardy, firefighters have the discretion to perform the rescue, and the "two-in/two-out" requirement is waived. There is no violation of the standard under such life-saving rescue circumstances.

- The two-in/two-out provision is not intended as a staffing requirement. It does not require fire departments to hire additional firefighters; it does not require four-person fire companies; it does not require four persons on a fire truck. Most fire departments have more than four firefighters and can assemble the numbers required on the scene by waiting for others to arrive. During this time the fire may be attacked only from the outside, sizing-up operations may occur, and emergency rescue necessary to save lives may take place as discussed above. The "two-in/two-out" rule is a worker safety practice requirement, not a staffing requirement.

- The standard allows one of the standby firefighters to have other duties such as serving as the incident commander, safety officer, or operator of fire apparatus. However, one of the outside firefighters must actively monitor the status of the inside firefighters and may not be assigned additional duties. The second outside firefighter may be involved in a wide variety of activities. Both of the outside personnel must be able to provide support and assistance to the two interior firefighters; any assignment of additional duties for one of the outside firefighters must be weighed against the potential for interference with this requirement. Proper assignment of firefighting activities at an interior structural fire must be determined on a case-by-case basis and is dependent on the existing firefighting situation. Compliance will always depend on consideration of all the worksite variables and conditions, and the judgement of the incident commander is critical in meeting this performance standard.

- The two firefighters (buddies) entering an IDLH atmosphere to perform interior structural firefighting must maintain visual or voice communication at all times. Electronic methods of communication such as the use of radios shall not be substituted for direct visual contact between the team members in the danger area. However, reliable electronic communication devices are not prohibited and certainly have value in augmenting communication and may be used to communicate between inside team members and outside standby personnel.

- For further explanation refer to the preamble of the Respiratory Protection standard (vol. 63, No. 5, 1245-1248) and the Respirator Question and Answer document (August 3, 1998). Both documents can be found at OSHA’s Homepage -

www.osha.gov.

b. Inspection Guidelines - Section (g)(4) includes the requirements of (g)(3). The first and critical step in evaluating an employers response using the two-in/two-out rule is to determine if there was interior structural fire fighting activity. This determination will require consideration of the factors existing at the time of the firefighting action and the basis for the Incident Commander's finding. CSHO should seek expert opinion from other authorities such as a state or local fire Marshall or other fire protection professionals and should thoroughly interview affected personnel to document the violation.

c. Citation Guidelines - If the CSHO's investigation reveals that the two-in/two-out rule was not followed during the interior attack of an interior structural fire and there was no reasonable expectation that someone was in jeopardy inside the building, the CSHO should cite (g)(4)(i) or (g)(4)(ii) as a serious violation. If adequate communication is not maintained between the team inside and the standby personnel located outside the IDLH, (g)(3)(ii) should be cited.

I. **Maintenance and Care of Respirators - 1910.134 (h)(1):** Respirators must be cleaned and disinfected as often as necessary to keep them in a sanitary condition. They must be properly stored to prevent damage and contamination, inspected regularly and repaired as necessary.

1. Inspection Guidelines. To ensure that respirators are clean and in good working order, the employer can have respirators cleaned and repaired in a centralized operation where respirators are passed out to employees OR the employer may require the respirator user to perform all cleaning and respirator maintenance functions. The CSHO should verify that the procedures in the mandatory Appendix B-2 or an equivalent method specified by the manufacturer are being followed and are performed by employees who are adequately trained in the proper respirator care procedures. Respirators issued to more than one employee must be cleaned and disinfected before being worn by another user. The use of individually-wrapped cleaning towelettes may be used as an interim method in the cleaning schedule for individually assigned respirators, but they must not be the only method in place. During fit-testing, towelettes may also be used between employees being tested, however these respirators must be thoroughly cleaned at the end of each day, using the procedures in Appendix B-2.

   The employer must ensure that respirators are inspected before each use and during cleaning. The CSHO should observe the condition of the respirators being used in the workplace. One or more respirators should be checked before employees enter, or as they leave the respirator area. A minimally acceptable inspection procedure for ALL respirators includes a check of respirator function, tightness of connections and the condition of the various parts, including but not limited to, the face piece, head straps, valves, connecting tube, and cartridges, canisters, or filters, and a check of

the respirator's elastomer parts for pliability and signs of deterioration.

SCBA's also require an inspection of the air and oxygen cylinders to assure that the cylinder pressure is maintained at 90% of the manufacturer's recommended pressure level and that the regulator and low pressure warning devices function properly. To assure that both the regulator and low pressure warning devices function properly the warning device must be activated and heard by the person performing the inspection. The CSHO should interview the individual who is inspecting SCBA's to determine if these regulator and low pressure warning devices are being activated according to the respirator manufacturer's instructions.

The CSHO should also observe how respirators are stored in the workplace. Respirators must be properly stored to protect them against physical damage, contamination, excessive moisture, extreme temperatures, sunlight, and damaging chemicals. Emergency use respirators must be stored in compartments OR in covers, both of which must be clearly marked as containing the emergency respirators.

2. Respirators That Are Available for Emergency Use: An inspection must be conducted monthly for all emergency use respirators. The employer must certify in writing that an inspection was performed. The certification must include the name (or signature) of the person who made the inspection, the findings of the inspection, any remedial action, and a serial number or other means of identifying the inspected respirator. The respirator must also be checked before and after each use.

    a. Emergency escape-only respirators carried by employees must be inspected before being taken into the workplace for potential use.

3. Section (h)(4) Repairs: Defective respirators must be removed from service. A respirator is defective if one or more of its components is missing, damaged, or visibly deteriorated. The employer must develop some means to ensure defective respirators are not used in the workplace. The employer can comply by placing an "out of service" tag on the respirator to help ensure that the defective respirator is not inadvertently used or by removing the respirator from the work area. An "appropriately trained" person must be responsible for performing repairs or adjustments to respirators.

4. Inspection Guidelines. The CSHO must interview the employee(s) at the worksite who repair respirators, and determine what training they have received. An appropriately trained person is an individual who has received training from the manufacturer or otherwise has demonstrated that he or she has the skills to return the respirator to its original state of effectiveness. The training is performance-oriented, so it is acceptable for the employee to have acquired the skills through practice rather than by attending a formal training course. Repairs to reducing and admission valves, regulators, and alarms must be done by a technician trained by the manufacturer.

    a. Only the respirator manufacturer's NIOSH-approved parts that are

designed for the particular respirator being repaired can be used to repair a respirator.

b. CSHOs should cite for defective respirators not effectively being removed from service.

J. **Breathing Air Quality and Use 1910.134 (i):** Compressed breathing air must meet at least the requirements for Grade D breathing air. The ANSI/CGA G.7-1 - 1989 specifies the contents of Grade D breathing air as: oxygen (volume/volume) of 19.5 to 23.5 %; hydrocarbon (condensed) of 5 mg/m³ of air or less; carbon monoxide of 10 ppm or less; carbon dioxide of 1,000 ppm or less; and the lack of a noticeable odor.

1. Inspection Guidelines. If compressors are used to supply breathing air, the CSHO should note the location of the compressor intake and ensure it is located in an area uncontaminated by either combustion exhaust gases produced by vehicles or the compressor itself (if applicable), or by other exhaust gases ventilated from plant processes. A tag containing the signature of the person authorized by the employer to change the in-line sorbent beds and filters and the date of the latest change must be maintained at the compressor.

   For air compressors that are **not** oil lubricated, a CO alarm is not required. However, the employer is required to ensure that carbon monoxide levels in the breathing air do not exceed 10 ppm. Some practical methods for ensuring that the carbon monoxide level does not exceed 10 ppm include; placing the air intake for the compressor in an area that the employer knows is free from contaminants; frequent or continuous monitoring of the breathing air supply; the use of carbon monoxide filters; or the use of a high temperature alarm or shut off devices.

   If the employer is using an oil-lubricated air compressor, it must have either a carbon monoxide alarm, high temperature alarm, or both. If only a high temperature alarm is used, then the breathing air must be tested for the presence of carbon monoxide at intervals sufficient to ensure that carbon monoxide levels do not exceed 10 ppm. The alarm must be able to alert the users or another employee who knows to alert any respirator users.

   If cylinders are used they must be marked with a NIOSH approval label. Cylinders of purchased breathing air must have a certificate of analysis from the supplier that the breathing air meets the required Grade D air and moisture content.

   If compressed or liquid oxygen is used, it must meet the specifications for breathing oxygen outlined by the United States Pharmacopoeia (USP). Compressed oxygen must not be used for any respirators that previously used compressed air.

   All breathing air couplings must be incompatible with those of non-respirable air or other gases used at the site to prevent inadvertent servicing of air line respirators with non-respirable gases or oxygen.

K. **Identification of Filters, Cartridges, and Canisters 1910.134 (j):** The employer must ensure that all canisters and filters are properly labeled and color coded with the NIOSH approval label and that the label is not removed, obscured, or defaced while in service. This requirement enables the employee using the respirator to check and confirm that the respirator has the appropriate filters before the respirator is used and also allows fellow employees, supervisors, and the respirator program administrator to readily determine that the employee is using the appropriate filters.

1. Inspection Guidelines. The CSHO should verify that properly labeled filters and canisters are being used, and that the labels remain legible.

2. Citation Guidelines. Date and time labels applied to the filters/cartridges should not be considered violations, but the employer must obscure as little as possible of the label to allow ready identification.

L. **Training and Information 1910.134 (k):** The employer is required to provide effective training to employees who wear respirators. Training must be provided prior to an employee's use of a respirator in the workplace and must be comprehensive and understandable. Training must recur annually, and more often if retraining appears necessary to ensure safe use. The employer must ensure that each employee can demonstrate a knowledge of all items in (k)(1)(i) thru (vii). Pre-testing may be used as a training aid to determine extent of retraining required.

1. Inspection Guidelines. The effectiveness of the training program can be evaluated by determining how well employees understand how to use their respirators. If respirators are improperly worn, missing parts, dirty, improperly stored, or the wrong cartridges are being used, the compliance officer should interview the employee for knowledge of the respirator requirements.

   Employees should be interviewed to determine if they have received the required training and the extent of that training. If the CSHO detects a trend in employee responses that indicate training is not being conducted, or is conducted in a cursory manner, a closer review of the training program is necessary.

   Employees who voluntarily wear respirators must, at least, be given the information in Appendix D.

2. Citation Guidelines. Lack of training should be cited. Citations for insufficient training should usually be based on several interviews that reveal a lack of understanding of the respirator program. Lack of knowledge about the hazards for which the respirator is being used, could also indicate a deficiency in the employer's Hazard Communication training [1910.1200(h)].

M. **Program Evaluation 1910.134(l):** The employer must conduct evaluations of the workplace to ensure the written respiratory protection program is properly implemented. The employer must observe and consult employees to determine if

they have any problems with the program and ensure that the respirators are used properly.

1. Inspection Guidelines. The CSHO should evaluate how well the written respiratory program is being implemented in the workplace. Observed deficiencies in the program and evaluation procedures should be discussed with the program administrator to determine what previous efforts she or he may have made to evaluate how well their program was working. Deficiencies should also be discussed with employees to determine how long any deficiency has existed and what requests or complaints about the respirator program if any they have made to the program administrator. If the program administrator keeps a written assessment, implemented changes may be considered as efforts toward improvement. Recent changes in the workplace such as new processes should have been evaluated for necessary respiratory program changes.

2. Citation Guidelines. Multiple deficiencies found during the inspection, especially long term deficiencies, could indicate inadequate program evaluation.

N. **Recordkeeping - 1910.134(m):** For every employee required to wear a respirator, the employer must establish and retain medical evaluations and fit-testing records. Medical evaluation records must also be retained for employees who wear elastomeric facepiece respirators. An employee's medical evaluation records must be made available to the employee and to OSHA in accordance with 1910.1020. The employer must also make an employee's fit-testing records available to that employee and to OSHA. The standard does not intend for the employer to make an employee's medical or fit-testing records available to any other individual unless that individual is the employee's "designated representative" as defined in 1910.1020(c)(3).

1. Inspection Guidelines. Even though the employer must ensure the medical evaluations are maintained, the actual medical evaluations will normally be maintained with the PLHCP, not the employer. Alternatively, the company nurse or doctor may maintain these files, but only medical confidentiality is maintained. The employer must retain a record of the medical evaluation which includes the PLHCP's written recommendation. If an employee states she or he has not had a medical evaluation, the CSHO should check if a medical evaluation record is on file.

   Fit test records must be kept until the next fit test is administered. Each fit test record must contain the employee identification, type of fit test, date last tested, the results of the test, and the make, model and size of the respirator tested. The CSHO should review these records to verify that fit-testing is being done annually and confirm that the fit-tested respirators are the same models and sizes as those observed in the workplace.

   The CSHO should also check on the availability of the written program.

2. Citation Guidelines. If a medical evaluation record cannot be found, it must be determined whether the record was not maintained or the evaluation was not performed. If not maintained, (m)(1) would normally

be cited. If no record can be found and the employee confirms an evaluation was not performed, then (e)(1) would be cited.

Lack of a fit test record or lack of information on a fit test record would be cited under (m)(2). If an employee is wearing a respirator different from that found in his fit test records then (f)(2) should be cited. Improper fit testing procedures would similarly be cited under the appropriate subparagraph in (f).

O. **Dates 1910.134 (n):** The final standard became effective April 8, 1998. By September 8, 1998, the employer must have evaluated the workplace to determine if respirator use is required. Compliance with all provisions is required no later than October 5, 1998.

P. **Appendices**: All appendices are mandatory.

1. Appendix A details fit testing protocols [see paragraph (f)(5)].
2. Appendix B-1 details User Seal Check Procedures [see paragraph g(1)(iii)].
3. Appendix B-2 details Respirator Cleaning Procedures [see paragraph (h)(1)].
4. Appendix C is the OSHA Respirator Medical Evaluation Questionnaire [see paragraph (e)(2)].
5. Appendix D is Information for Employees Using Respirators When Not Required Under the Standard. This appendix must be provided to all employees who voluntarily use respirators. [see paragraph (c)(2), (k)(6)]

VIII. **Interface with Other Standards.**

A. PEL Overexposures. Overexposures to Permissible Exposure Limits will usually be linked to compliance with the respirator standard. Most of these PEL's are listed in Tables Z1- Z3 in 1910.1000 and Appendix A in 1926.55.

B. Standards Regulating Toxic Substance Exposure. A number of industry-specific standards and substance-specific standards regulating exposure to toxic substances have been affected by the new respirator revisions. Many paragraphs from these standards that addressed respirator use, selection, and fit testing were deleted and now refer to the provisions in 1910.134. Violations will now be cited under the appropriate paragraphs of 1910.134.

C. Medical Records Access. The Access to Employee Exposure and Medical Records Standard (29 CFR 1910.1020) requires that employees have access to all medical and exposure records generated under this standard.

IX. **Classification and Grouping of Violations.** The procedures in chapter III of the Field Inspection Reference Manual (FIRM) should be followed. The FIRM describes the circumstances, such as proposing Willful or Criminal violations, where the CSHO or AD may need to consult the Region or the Solicitor's office. The Citation Policy for Paperwork and Written Program Requirement Violations, CPL 2.111 , should be reviewed for guidance when citing the written program.

X. **Authorization to Review Limited Medical Information.** Appropriately qualified

compliance personnel are authorized to review medical records and medical opinions pertinent to compliance with the Respiratory Protection Standard. There are four directives that address the limitations and procedures which are to be followed. They are OSHA Instruction(s) CPL 2-2.30 (Authorization to Review Medical Opinions); CPL 2-2.32 (Access to Biological Monitoring Results); CPL 2-2.33 (Written Access Orders); and CPL 2-2.46 (Authorization to Review Specific Medical Records). In general, each of these instructions defines "qualified compliance personnel" as a field-qualified Industrial Hygienist who is at the journeyman level or a professional with specific training or experience in medical disciplines. When inspections are conducted by teams, the Team leader should ensure that a team member is so qualified.

XI. **Training for OSHA Personnel.**

A. CSHO Experience. For all inspections on a site where respirators are used and the exposures are expected to be above the 8-hour TWA or the STEL, only experienced and properly trained CSHOs shall perform the on-site evaluations. CSHOs are expected to be knowledgeable of the:

1. Potential hazards which may be encountered at the site,
2. Contents of the Respiratory Protection standard,
3. Appropriate PPE to be worn. Each CSHO who will be expected to use PPE must be trained in the proper care, use, and limitations of the PPE.

   Instructions for the use of respiratory protection by CSHO's are contained in OSHA Instruction CPL 2-2.54. The CSHO should closely review and examine all the data available on site concerning the exposures or potential exposures in this particular location. If the employer cannot supply adequate data to support the selection of the types of respirators that are in use, the CSHO must not enter the areas where respirators are in use. If the hazard determination performed by the employer has been completed in accordance with the standard, the CSHO must don the appropriate respirator required in that work-site prior to the walkaround in areas where respirators are required.

B. Emergency Procedures. For all inspections on a site where OSHA personnel are investigating an emergency that involves hazardous substances, the CSHO must be knowledgeable of:

1. Appropriate training required by 29 CFR 1910.120, or any applicable annual refresher training;

2. The ARA for Technical Support must be consulted for assistance in determining the appropriateness of SCBA use by CSHOs.

XII. **Medical Examinations for OSHA Personnel.**

A. Regional Administrators and Area Directors are responsible for implementing the CSHO Medical Examination program in accordance with OSHA Instruction, PER 8-2.5. This medical evaluation is more stringent than what is required by the revised Respiratory Protection Standard.

B. Many of the hazards that CSHO's may encounter are already regulated by the

medical surveillance requirements in other OSHA standards. CSHOs who are required to wear any respiratory protection and Level A or B PPE must be medically cleared via the CSHO Physical Examination procedures.

XIII. **Protection of OSHA Personnel.** The paramount concern addressed in this section is the protection of the CSHO. Compliance Officers are reminded about Agency policy that requires that appropriate personal protective equipment be used when exposed to a hazard. When and if a CSHO is not adequately protected by the use of appropriate PPE, the CSHO should stay out of the contaminated area to avoid being overexposed to any hazardous substance.

A. Personal Protective Equipment (PPE).

1. Regional Administrators and Area Directors must ensure that appropriate PPE is available for the CSHO.

a. Respirators must be selected in accordance with 1910.134.

b. Eye and face protection must meet the requirements of 29 CFR 1910.133.

APPENDIX A.

CHANGE SCHEDULES GUIDE - A LISTING OF METHODS

A brief description of some currently available approaches or methods for respirator cartridge change schedules is presented below. The CSHO should assess the "Good Faith" efforts of the employer on a case by case basis and contact appropriate regional OR National office staff for guidance, as necessary. This is not intended to be an exhaustive list, but a summary of some reasonable methods that an employer may take in creating a change schedule. No matter which method is used, the employer must maintain any data used in making their decision as part of their program.

Manufacturers Objective Data: Respirator cartridge model-specific objective data that is available from the manufacturer or through a distributor may be used to establish change schedules. Objective data may be presented in tabular or graphical format or simply provided verbally over a manufacturer’s telephone help line. Some manufacturers have developed elaborate computer programs available on the Internet that provide the necessary objective data to the user.

Experimental Methods: Experimental breakthrough-time data from a laboratory based on worst case testing of simulated workplace conditions. This method can provide fairly accurate service life data compared to other available methods.

Mathematical Predictive Modeling: One tool that has demonstrated value is the use of mathematical modeling based on predictive equations. These models are typically complex

and require considerable expertise to apply. They also require some proprietary information from the respirator manufacturer. OSHA fully supports the further development and validation of these models. The agency believes that respirator manufacturers may be in the best position to apply them to their products.

Analogous Chemical Structures: Employer would rely on service life values from other chemicals having analogous chemical structure to the contaminant under evaluation for breakthrough. Or in some cases a chemical with known migration may reasonably be anticipated to act as a surrogate for a similar chemical that would have less rapid migration (e.g., an employer could assume that a heavier, less volatile compound than another in the same chemical series that had been tested for breakthrough would breakthrough no faster than the latter compound, such as benzene versus toluene.) The use of this method requires a substantial amount of judgement and assumption of similar chemical properties. The use of analogous chemical structures should be infallible as long as objective data or information for lower molecular weight compounds is used to predict the breakthrough times for higher molecular weight analogues containing only additional methyl or phenyl groups. Data from higher molecular weight groups should not be used to predict the behavior of analogous substances with lower molecular weight. This approach relies heavily on experimental data and expert analysis. This method may be less accurate than others and should be used only when better information is not available.

Workplace Simulations: Unvalidated methods exist or are under development where the respirator cartridge is tested in the workplace in "real time" and under actual conditions of use. Simple designs have been informally described to the agency. Workplace air during representative conditions is drawn over the cartridge at a rate approximating normal breathing at a higher work rate. An air sampling/analytic device would be placed on the other side of the filter to measure the time of breakthrough. Employers could incorporate this type of testing into their air monitoring program using sampling strategies established in their workplace. In theory, these approaches should be an accurate method for determining change schedules and could accommodate fluctuating conditions of humidity, concentration, etc., to allow less conservative schedules that utilize a larger fraction of the true service life.

Rules of Thumb: Generalized rules or guidance can be generated from experimental work. Presented below is a rule of thumb for estimating organic vapor service life found in Chapter 36 of the American Industrial Hygiene Association publication

"The Occupational Environment Evaluation and Control".

*If a chemical’s boiling point is >70 C and the concentration is less than 200 ppm you can expect a service life of 8 hours at a normal work rate.
Note: This first rule of thumb needs further review.

* Service life is inversely proportional to work rate.

* Reducing concentration by a factor of ten will increase service life by a factor of five.

* Humidity above 85% will reduce service life by 50%.

These generalizations should only be used in concert with one of the other methods of predicting service life for specific contaminants.

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