VOSH PROGRAM DIRECTIVE: **09-004** **ISSUED**: **01 August 2012**

SUBJECT: **Respiratory Protection Manual**

Purpose. This directive is renumbered to the 09 series [Program Operations, Analysis and Evaluation] from the 02 series [Compliance Instructions] to more accurately conform to the VOSH Program Directives' classification and numbering system as specified in VOSH Program Directive 01-001A. This directive continues the transmittal to field personnel policies and procedures to be followed by all VOSH personnel and other Department employees in selecting and using respirators.

This Program Directive is an internal guideline, not a statutory or regulatory rule, and is intended to provide instructions to VOSH personnel regarding internal operation of the Virginia Occupational Safety and Health Program and is solely for the benefit of the program. This document is not subject to the Virginia Register Act or the Administrative Process Act; it does not have general application and is not being enforced as having the force of law.

Scope. This directive applies to all Department of Labor and Industry (DOLI) employees who visit workplaces on a regular, routine basis as a part of their assigned job duties. Specifically, this directive is applicable to employees of the Safety Compliance Division; Health Compliance Division; Boiler Safety Compliance Division; Cooperative Programs Division; Labor Law Division; and the Apprenticeship Training Division.

- Representatives and Supervisors in the Division of State Labor Law and the Apprenticeship Program will not at any time or under any conditions knowingly enter a workplace with a hazardous environment or atmosphere. Should it be necessary to obtain data or information in such an area, Supervisors in these Divisions will contact the applicable VOSH Regional or VOSH Compliance Manager for assistance. The VOSH Compliance Manager will assign an Occupational Health Compliance Officer to work with the Representative. The Occupational Health Compliance Officer, equipped with the proper respirator, will obtain the required data or information from the affected area for the Representative.

- All Compliance Officers in the Health Compliance Division and Health Consultants in the Consultation Services Division and VOSH Training Division will be fit tested annually for respirator use.

- All Compliance Officers in the Safety Compliance Division and in Consultation Services and Inspectors in the Boiler Safety Compliance Division will not knowingly enter a

hazardous environment or atmosphere without first consulting the Regional Respiratory Program Coordinator.

Reference. 63 FR 1152 (January 8, 1998)

Cancellation. VOSH Program Directive 02-435 (February 15, 2000)

Effective Date. 01 August 2012

Action. The Assistant Commissioner – Programs, Directors and Managers shall assure that the guidelines in this Directive are followed by all Department employees in selecting and using respirators.

Courtney M. Malveaux
Commissioner

Attachment: Respiratory Protection Manual

Distribution:
Commissioner of Labor and Industry
Assistant Commissioner – Programs
VOSH Directors and Managers
Legal Support and IMIS Staffs
Cooperative Programs Director and Manager
VOSH Compliance and Cooperative Programs Staffs
OSHA Region III and OSHA Norfolk Area Offices

When the guidelines, as set forth in this Program Directive, are applied to the Commissioner of the Department of Labor and Industry and/or to Virginia employers, the following federal terms if, and where they are used, shall be considered to read as below:

Federal Terms	VOSH Equivalent
29 CFR	VOSH Standard
Regional Administrator	Commissioner of Labor and Industry
Area Director	Regional Director
Regional Solicitor	Attorney General or VOSH Office of Legal Support (OLS)
Agency	Department
Office of Statistics	VOSH Research and Analysis
Compliance Safety and Health Officer (CSHO) and/or Industrial Hygienist	CSHO
OSHA Directives:	***VOSH Program Directives:***
Field Inspection Reference Manual (FIRM)	VOSH Program Directive 02-001D, VOSH Field Operations Manual (FOM)

Virginia Department of Labor and Industry

Respiratory Protection Program Manual

VIRGINIA OCCUPATIONAL SAFETY AND HEALTH PROGRAM

RESPIRATORY PROTECTION

PROGRAM MANUAL

Office of Occupational Health Compliance

Revised 01 August 2012

TABLE OF CONTENTS

1.0 Purpose

Virginia Occupational Safety and Health (VOSH) Compliance Safety and Health Officers (CSHOs) as well as other Agency personnel may be exposed to a variety of respiratory hazards while conducting safety and health compliance inspections, consultation or monitoring visits. These hazards include dusts, fumes, mists, gases, vapors, smoke, and in some cases represent Immediately Dangerous to Life or Health (IDLH) conditions.

Avoiding or minimizing exposure to harmful substances can protect the human respiratory system; however, in some cases, this may not be possible and an appropriate respirator will be required. Certain respirators can reduce/remove many contaminants from an atmosphere. When concentrations of these contaminants are too high to be reduced/removed or when oxygen levels are too low, other respirators are available which can supply breathing quality air to the wearer. Therefore, proper selection of the appropriate respirator for the conditions at hand is mandatory.

This program sets forth accepted practices for respirator users, provides information and guidance on the proper selection, use, and care of respirators, and contains requirements for establishing a VOSH respirator program.

2.0 Scope and Application

This instruction applies to all VOSH employees who need to wear a respirator to perform his/her duties.

In addition, any employee who voluntarily wears a respirator when a respirator is not required is subject to the medical evaluation, cleaning, maintenance, and storage elements of this program, and must be provided with certain information specified in this section of the program.[1]

Employees participating in the respiratory protection program do so at no cost to them. The expense associated with training, medical evaluations and respiratory protection equipment will be borne by the employer.

---

[1] Employees who voluntarily wear filtering facepieces (dust masks) are not subject to the medical evaluation, cleaning, storage, and maintenance provisions of this program.

3.0 Responsibilities

The guidelines established in this program may be supplemented as local needs dictate. However, all requirements in this directive MUST be included in Regional/Field Office programs. Concerns related to the implementation of this program should be directed to the Agency Program Administrator.

Central Office

The following duties will be carried out in the Central Office:

- The Occupational Health Compliance Director will appoint an Agency Program Administrator to administer and evaluate the overall program.
- Purchasing the proper type of equipment and adequate quantities.
- Administering the medical surveillance program.
- Maintaining records required by the program.

Agency Program Administrator

The Agency Program Administrator is responsible for monitoring Regional/Field Office adherence to the procedures established in this directive. Duties of the Agency Program Administrator include:

- Administering the respiratory protection program for the Agency.
- Assisting the Regional Respiratory Program Coordinators in complying with the program.
- Issuing guidelines and directives that initiate and update the program.
- Recommending appropriate respiratory protective equipment.
- Recommending systems for complying with the program and assist in technical requirements.
- Arranging for and/or conducting training.
- Auditing and reviewing the effectiveness of the program.

The assigned Agency Program Administrator is _____
Position (Title**)**

Regional Respiratory Program Coordinator

Each Regional Director will delegate authority for the coordination of the program to an individual within the Regional or Field Office who has been trained in the use and care of specific types of equipment as determined by the Central Office. Responsibility and authority for the respirator program will be assigned to a single person. This individual will be designated as the Regional Respiratory Program Coordinator. The Regional Respiratory Program Coordinator will assume responsibility for administering the program in the Regional/Field Office. The Regional Respiratory Program Coordinator will:

- Attend the OSHA Training Institute respiratory protection course.
- Be responsible for cleaning, maintenance and storage of all respirators not routinely used, or not individually assigned.
- Maintain respirator supplies, including spare parts; obtain new equipment and maintain non-individually assigned equipment ready for use.
- Ensure that sufficient quantities of filters and chemical cartridges and canisters for specific contaminants will be available in each Regional/Field office.
- Conduct quantitative and/or qualitative fit testing of all CSHOs in the Regional/Field office who wear respirators.
- Provide additional training and information for CSHOs in the correct use, maintenance, cleaning and care of respirators. Respirators will be repaired under the direction of the AGENCY PROGRAM ADMINISTRATOR.
- Evaluate the effectiveness of the respirator program at least quarterly, or more frequently as the need arises. The following elements should be considered when evaluating the program's effectiveness:
- The proper types of respirators are selected.
- The wearers are properly trained.
- The correct respirators are issued.
- The respirators are worn properly.
- The respirators are properly maintained and cleaned.

- Fit testing is conducted properly.
- All fit testing records are kept.
- Submit the report to the Agency Program Administrator after each evaluation of the Program.

The assigned Regional Respiratory Program Coordinator for the _____
Regional or Field Office

is _____
Name and/or title

Compliance Safety and Health Officers

CSHOs assigned tasks which require respiratory protective equipment will use the appropriate equipment in accordance with this directive. Each CSHO has the responsibility to wear his or her respirator when and where required and the manner in which they were trained. CSHOs will be aware that the manner in which respiratory protection is used by VOSH CSHOs is usually noted by the personnel at the facility being inspected. Thus, CSHOs will use respiratory protection following the requirements of 1910.134. CSHOs must also:

- Clean, disinfect and properly store as necessary, the respirator(s) assigned for personal use. Cleaning agents will be available in each Regional/Field office.
- Inspect the respirator before each use and after cleaning and disinfecting. The inspection will include a check for defects, missing parts and a facepiece leak check (user seal check) each time the respirator is donned. If a respirator is found to be defective or no longer fits, it will be returned to the Regional Respiratory Program Coordinator.
- Comply with the fit test requirements and all other provisions of this directive. All CSHOs must be clean shaven in the respirator-to-face sealing area at all times that respirators are worn which require a face seal, including times that the respirator fit tests are required, as well as during inspection activity when a respirator is not needed due to exposure levels but is required by the facility being inspected.
- Inform their supervisor or Regional Respiratory Program Coordinator of any respiratory hazards that they feel are not adequately addressed in the workplace and of any other concerns that they have regarding the program.

4.0 Program Elements

Respirator Use

- Respirators and accessories will be made available for VOSH employees for use when conducting compliance inspections, consultation or monitoring visits. Respirators will be worn whenever requested by the employer, as well as during the time a VOSH employee is in a contaminated area performing air sampling, since the possibility of overexposure exists. Even in the event that air sampling is not being performed, and a VOSH employee is in a contaminated area which is likely to exceed the PEL (e.g., a previous citation for overexposure was issued to the company for that area), respirators will also be worn. Exceptions to this policy may include air samples taken for screening purposes or other situations as individually approved by the supervisor. VOSH personnel are encouraged to wear respirators at any time they feel it is appropriate for their self-protection.

- Written standard operating procedures (SOP) will be obtained from the respirator manufacturer, including all information and guidance necessary for proper selection, use, care, and maintenance of the respirator. Written SOPs will be maintained by the Regional/Field office and will be modified to suit the needs of each field location.

- Respirators will be selected on the basis of hazards to which the person is exposed with consideration given to both safety and health factors as well as possible risk. Individuals issuing respirators will be adequately instructed to ensure that the correct respirator is issued and that each respirator is complete. To the extent possible, half mask respirators should be assigned to individual workers for their exclusive use. No CSHO is to wear a self-contained breathing apparatus (SCBA) or other supplied air respirator unless specifically authorized by the Director of Occupational Health Compliance. Such authorization is to be seriously considered and limited; it is expected that CSHOs will rarely, if ever, be in atmospheres where an SCBA would be required.

- Before initial use, all new respirators will be washed, cleaned, sanitized and inspected per respirator manufacturer's instruction. Each respirator will be properly fitted and a leakage test performed. Before each use, user seal checks will be conducted. The user will be instructed and trained in the proper use of respirators and informed about their limitations.

- Respirators will be cleaned and disinfected by the wearer after use. Those used by more than one CSHO will be thoroughly cleaned and disinfected after each use. Respirators will be stored in a convenient, clean, and sanitary location free of contaminants which may damage the components of the respirator.

- Respirators used on a regular basis will be inspected during cleaning. Trained personnel will replace worn or deteriorated parts with the parts designed for the respirator. No attempt will be made to replace components or to make adjustments or repairs beyond the manufacturer's recommendations.

- Supervisors and CSHOs will be instructed and trained in the selection, use, care, and maintenance of respiratory protective devices. Training will provide each user an opportunity to handle the respirator, to have it fitted properly, to test its facepiece-to-face seal, to wear it in normal air for a familiarization period, and to wear it in a test atmosphere. Retraining will be performed as needed, at least annually to ensure an effective program.

- There will be regular inspections and evaluations to determine the continued effectiveness of the program.

- Clean- skin must be in contact with all respirator sealing surfaces. Even a mild growth of whiskers may interfere with this seal. In addition, respirators will not be worn when conditions such as sideburns, a skull cap that projects under the facepiece, temple pieces on corrective spectacles or goggles, or the absence of one or both dentures prevent a good facepiece-to-face seal. Therefore, while on duty, all VOSH employees within the scope of this policy must be clean shaven in the areas of the respirator face sealing surface and the face. If hair growth, other than in the clean shaven area of the facepiece-to-face seal, interferes with proper function of the respirator such as the exhalation valve, then it will be altered or removed so as to eliminate interference. The Agency's position is to provide negative pressure, half-mask or full-face piece respirators that can be tested with available fit testing equipment. The Agency will also provide tight fitting powered air-purifying respirators (PAPRs) to CSHOs upon request as required by VOSH standards. Corrective lenses which interfere with the facepiece-to-face sealing area will not be used with a full facepiece. Contact lenses may be worn with a full facepiece.

- Single use, disposable or maintenance free respirators, including filtering facepieces (dust masks) will normally not be used by VOSH personnel where the possibility of an overexposure exists. Since the CSHOs may encounter different air contaminants during an inspection, air-purifying respirators with replaceable cartridges will be used because these devices provide more flexibility and reduce the number of single respirators which need to be carried by the CSHOs. Furthermore, disposable, maintenance free or single use respirators provide a poorer facepiece seal than multi-sized elastomeric facepieces and often it is difficult to perform an effective user seal check. Usage of such respirators in areas where an overexposure would exist would require the CSHO to be fit tested with that respirator.

- Any respirator may produce undesirable effects on the wearer. Respirators are uncomfortable, and may reduce field of vision, require the individual to carry extra weight, place an additional burden on the respiratory system, cause a feeling of claustrophobia, and may result in a general feeling of anxiety. The two areas of greatest interest as far as physiological effects are concerned are the respiratory system and the cardiovascular system.

- CSHOs will not be assigned to tasks requiring the use of respirators unless it has been determined by medical authorities that the CSHO can perform his/her duties while wearing the respirator and any other protective clothing.

Selection Procedures and Change Schedules

General

- The guidelines outlined in this section provide assistance in the selection of appropriate respiratory protection by VOSH personnel. The Agency will provide appropriate NIOSH approved respiratory protective devices and the CSHOs will use these devices whenever necessary to protect their health due to the nature of the work environment. It is important that the safety and health professional assess the potential hazards and degree of controls which can be exercised over each situation. The respiratory protective devices selected in each situation will depend upon the information from a qualitative and/or quantitative determination of the hazard. It is essential that the CSHO exercise his/her professional judgement in order to insure appropriate selections of respirators.

- All respirators used must be certified by the National Institute for Occupational Safety and Health (NIOSH) and will be used in accordance with the terms of that certification. Thus, particulate respirators certified by NIOSH under 30 CFR part 11 will be used with high-efficiency particulate air (HEPA) filters unless used in an area where the mass median aerodynamic diameter (MMAD) of the particulate is 2 microns or greater. For the most part, CSHOs will not be aware of the particulate size. Thus, respiratory protection certified under 30 CFR part 11 will be used only with HEPA filters. Only "mechanical type" HEPA filters enclosed in cartridges or canisters are acceptable for protection against any particulate exposure because efficiency of these filters does not change with dust loading and ambient conditions.

  In addition, NIOSH has certified particulate respirators under 42 CFR part 84. Purchases of new particulate respirator supplies will be restricted to respiratory protection certified under 42 CFR part 84.

  Respirators will be selected for use in accordance with the maximum use concentration (MUC) of the respirator type.

  Also, all filters, cartridges, and canisters must be labeled with the appropriate NIOSH approval label. The label must not be removed or defaced while it is in use.

- The nature of a respiratory hazard as it refers to the selection and classification of respirators, depends upon the atmospheric oxygen concentration; a contaminant's physical state, toxicity, and concentration; the presence of other contaminants or stress factors in the working environment; and worker exposure time and susceptibility. Respiratory hazards may be classified as gas and vapor contaminants (immediately or not immediately dangerous to life or health), particulate contaminants (immediately or not immediately dangerous to life or health), and oxygen deficiencies. Each classification requires a different type of respiratory protection.

- In the selection and use of respiratory protective devices, health and safety factors must be considered, such as the nature of the hazard, intended uses and limitations of respiratory protective devices, movement and work rate limitations, emergency escape time and distance requirements, and training requirements.

- Among additional general considerations in determining the appropriate respirator are sorbent efficiencies, odor warning properties, eye irritation potential, protection factors (PF), lower flammability limit (LFL), and conditions which are immediately dangerous to life or health (IDLH – as defined in 1910.120). Reference materials are also available to assist in determining the general conditions or situations which would indicate the most prudent use of respirator protection (available from Agency Program Administrator).

Air-purifying Respirators

- In general, air-purifying cartridge or canister respirators will be allowed if the contaminant(s) is known, the concentration(s) is known, the air-purifying element provides adequate protection for the air contaminants, and the air contaminant(s) has good warning properties. Certain specific health standards permit the use of air-purifying respirators although the chemical has poor or no warning properties. This type of respirator may either be equipped with chemical cartridges or a canister for protection against gases and vapors.

  NOTE: Reliance on odor thresholds and other warning properties will not be the sole basis for determining that an air-purifying respirator will afford adequate protection against exposure to gas and vapor contaminants.

- With regard to particulate respirators, an increase in breathing resistance (comfortable breathing impaired), occurs as a result of the challenge particulate lodging on the respirator filter. Since this is a subjective indicator, the HEPA filter cartridge should be replaced at least once a week in moderate to dusty workplaces or every three weeks in low dust environments, when contamination of the cartridge surface is noted, or when the filter has been dropped or subjected to the other trauma.

- A much more insidious problem occurs concerning end of service life indication for gas and vapor cartridge/canister equipped respirators. End of service life indication is generally based on an individual's ability to detect (e.g., taste, smell) the contaminant within the respirators wearer's facepiece. This guideline is totally subjective and may expose the respirator user to considerable risk. Thus, such respirators are to be used with either an end-of-service indicator (ESLI) or using a change schedule.

  The basis of the subject detection principle is the assumption that gases/vapors in question have good warning properties. Often the necessary information relative to this timing factor is difficult to obtain or may not exist; i.e., the odor threshold of a particular material. Studies have

shown that certain people have only a moderately developed sense of smell. Olfactory fatigue may occur to individuals acclimatized to the odor.

Some gaseous contaminants will migrate across the adsorbent or absorbent bed while the respirator is not in use, such as overnight. This migration subjects the user to an initial dose of the contaminant when the respirator is again placed in service. Therefore, as a minimum, gas/vapor cartridges will be disposed of after each day's activities no matter how short those activities were.

A day's activities would begin when the plastic seal or bag is removed from the cartridges allowing those cartridges to be exposed to moisture. These cartridges, even if they are not exposed to a contaminated atmosphere, must be discarded. A label must be attached to the cartridge indicating the installation date.

- Since odor threshold and olfactory fatigue vary among different individuals, the use of chemical cartridge respirators against substances with poor warning properties will not be permitted unless its use is permitted in specific health standards. In this case, reliable information concerning service life must be available. Since some reactive chemicals cannot be effectively adsorbed by the sorbent, its use should also be restricted. A **PARTIAL** (not all inclusive) list of air contaminants with poor odor warning properties or short breakthrough time follows:

  Acrolein, aniline, arsine, boron hydrides, bromine, carbon dioxide, carbon monoxide, carbonyls, carbon disulfide, cyanogen dimethylaniline, dimethyl sulfate, fluorine, hydrogen cyanide, hydrogen fluoride, hydrogen selenide, hydrogen sulfide, isocyanates: HDI, MDI, MIC and TDI, methanol methyl bromide, methyl chloride, methyl iodine, nickel carbonyl, nitrocompounds: nitrobenzene, nitrogen oxides, nitroglycerine, nitromethane, ozone, phosgene, phosphine, phosphorous trichloride, stibine, sulfur chloride, and vinyl chloride.

- With regard to air-purifying respirators, the fit factor obtained during fit testing has little predictive ability for determining the specific level of protection that will be achieved all of the time in the workplace. Because of this, the respirator assigned protection factors listed in Table 4-1 should not be exceeded no matter how high the fit factor during fit testing.

Atmosphere Supplying Respirators

- Normally a CSHO, both health and safety, will not enter, without prior Central Office approval, an area where an atmosphere supplying respirator is required.

Whenever possible, evaluation methods, i.e., sampling strategies, will be applied that will not require entry into an extremely hazardous area. In those situations where entry must be made into potentially oxygen deficient environments or contaminated atmospheres which are IDLH, an appropriate approved atmosphere supplying respirator must be used. Some situations which may require the use of such respiratory protective equipment include entry into confined spaces, hazardous substance spill/waste

disposal areas, employer requirement for specific atmosphere supplying respiratory protection and emergency investigations requiring entry into potentially IDLH atmospheres. The Director of Occupational Health Compliance may delegate to the Regional Director and/or Compliance Manager the approval authority for use of SCBA in non- IDLH situations.

- An SCBA must not be used in IDLH or potentially IDLH atmospheres unless a second standby CSHO is present and also equipped with a SCBA. The CSHO must be in communication (visual, vocal or signal) with the other CSHO at all times. The second CSHO will be present to provide any needed assistance or rescue. A fully charged spare air cylinder must always be available. Additionally, consideration for other than respiratory protection needs must be given in situations where skin absorption/irritation potential may be present. The standby CSHO will have the necessary training and equipment to perform a rescue if needed.

- Learning and "hands on" experience with SCBA must be ongoing and continuous. CSHOs who are designated to use SCBA are to be trained in the operation and use of the devices and are to follow the manufacturer's directions and the Agency respiratory protection program. The training must be on a regular basis (i.e., annually) and include the actual wearing and use of SCBA during exercise situations (e.g. walking). All SCBA wearers must be trained and certified by OSHA recognized training facilities. A list is available from the Agency Program Administrator.

- The Director of Occupational Health Compliance will be consulted for assistance in determining the appropriateness of SCBA use in a specific situation. Any planned entry involving the use of SCBA will be coordinated with the Director of Occupational Health Compliance.

- Since a respirator used non-routinely is principally used for hazardous situations or emergencies that occur only occasionally, routine inspection and proper maintenance are essential to assure that the designated degree of protection and useful service time are provided. Review of non-routine use respirators (i.e., SCBA) should be consistent with the recommendations of the manufacturer, the requirements of appropriate regulatory standards (e.g., 1910.134) and existing Agency policies. Depending on the specific SCBA available for use at a location, the items included in the maintenance program may require slight modifications to encompass additional considerations as suggested by the appropriate SCBA manufacturer(s).

Emergency Escape Respirators

- These devices constitute another class of non-routine use respirators. Any respirator that protects adequately against a hazardous atmosphere that has occurred suddenly may be used for escape purposes. However, these devices will not be used for entry into this type of atmosphere even if that entry is for rescue purposes. Escape respirators will be provided and carried by all individuals when there exists a potential for exposure to toxic materials at IDLH levels.

  Examples of these types of situations may exist in portions of refineries, chemical plants, sewage treatment plants, and hazardous waste sites etc. All emergency escape devices have limitations

and these limitations must be taken into account when selecting one of these respirators. When entering a potential IDLH atmosphere, the CSHO will assess the egress route to ensure that the emergency egress time does not exceed the capacity of the emergency escape respirator.

- If the toxic materials in question would cause eye irritation, then a full facepiece or hood must be used.

- Even full facepiece air-purifying emergency egress respirators such as gas masks are contaminant(s) specific and will fail to provide adequate protection at certain concentrations. In addition, those units will not provide a breathing atmosphere and therefore cannot be used in oxygen-deficient atmospheres. Since the conditions of most emergencies are unknown, VOSH emergency escape devices will be of the atmosphere supplying variety.

- If it is available, only the continuous flow escape SCBA with an air flow of 70 liters per minute will be used. If the anticipated escape time is in excess of the capacity of the continuous flow SCBA, mouthpiece SCBA will be used.

Table 4-1

RESPIRATOR SELECTION

TYPE	FACEPIECE PRESSURE	AXIMUM USE CONCENTRATION (MUC) IN MULTIPLES OF PEL
Half –mask	_	10 X
Full facepiece	_	50 X
Powered air-purifying:		
Half-mask	+	250 X
Full facepiece	+	500 X
Pressure Demand Supplied Air Respirator (PDSAR)		
Half-mask	+	250 X
Full facepiece	+	500 X
Full facepiece w/escape prov.	+	1,000 X
SCBA:		
Entry and escape:		
Full facepiece pressure demand	+	IDLH and Unknown Concentrations
Escape only:		
Continuous flow	+	IDLH
Mouthpiece	_	IDLH

NOTES:

1. Only a half-mask with interchangeable cartridges is acceptable.

2) Respirator assigned for higher concentrations may be used at lower concentrations.

3) Full facepiece is required if eye irritation is experienced.

4) A minimum service life of 60 minutes is required for sorbent cartridges and canisters to provide adequate protection against air contaminants having poor odor warning properties. The MUC of a respirator for protection against gases or vapors is limited by the service life of the sorbent. For example, if the cartridges used for protection against compound X have only a service life of 60 minutes at a concentration of 50 times the

PEL, then the MUC for a full facepiece PAPR equipped with these cartridges is only 50 times rather than 500 times the PEL listed in the respirator selection table.

5) If it is available, compressed air having a higher purity than Grade D, such as Grade H, or I should be used for the SAR and the SCBA.

6) Goggles supplied with the mouthpiece escape SCBA will be used when eye irritation is experienced.

7) Pressure demand supplied air respirators equipped with an auxiliary self-contained air supply may be used under IDLH conditions when the anticipated use time is longer than the service life of the SCBA and the auxiliary air cylinder provides sufficient time for escape.

8) If it is available, the continuous flow escape SCBA having an air flow of 70 liters per minute will be used.

9) Air-purifying respirators may not be used in oxygen deficient or IDLH atmosphere.

10) Tight fitting PAPRs with a minimum flow rate of 170 liters per minute will be used.

Medical Evaluations

The medical status of all CSHOs required to wear a respirator will be reviewed by the examining physician to determine that the CSHO is medically able to wear the respirator. This review will be conducted at the time of the VOSH physical for CSHOs.

- The examining physician will be given information about the equipment to be used. He or she should know whether it produces additional inspiratory and expiratory stress, whether it represents an additional weight, such as self-contained breathers, and whether it may cause an increase in the metabolic heat load, such as chemical protective clothing.

- CSHOs will not be assigned to tasks requiring use of respirators unless it has been determined by a physician that they are physically able to perform their duties while wearing the prescribed respirators and chemical protective clothing.

- The physician will provide a written opinion which describes the ability of the CSHO to wear the prescribed respirator and recommends limitations on the use of respirators, if any. All examinations and questionnaires are to remain confidential between the employee and the physician. A copy of the physician's written opinion regarding the CSHOs ability to wear respiratory protection will be forwarded to the Office of Human Resources.

- The medical status of the respirator user will be reviewed as part of the examinations required under DOLI's CSHO physical program. All CSHOs will be granted the opportunity to speak with the physician about their medical evaluation, if they so request.

- Follow-up medical examinations will be granted to CSHOs as required by the standard, and/or as deemed necessary by the examining physician.

- Any CSHO required for medical reasons to wear a positive pressure air purifying respirator will be provided with PAPR.

- After a CSHO has received clearance and begun to wear his or her respirator, additional medical evaluations will be provided under the following circumstances:

- CSHO reports signs and/or symptoms related their ability to use a respirator, such as shortness of breath, dizziness, chest pains, or wheezing.

- The examining physician or supervisor informs the Agency Program Administrator that the employee needs to be reevaluated.

- Information from this program, including observations made during fit testing and program evaluation, indicates a need for reevaluation.

- A change occurs in workplace conditions that may result in an increased physiological burden on the employee.

Fit Testing

General

There are two methods available for fit testing respirators, quantitative fit testing (QNFT) and qualitative fit testing (QLFT). QNFT will be used for fit testing all CSHOs. QLFT may be used to meet the requirements for a specific standard such as asbestos or acrylonitrile.

CSHOs must be fit tested with the same make, model, style and size of respirator that will be used. If QNFT cannot be done for a tight fitting negative pressure air-purifying respirator (i.e., no probed facepiece is available), then QLFT may be performed. However, a qualitatively fit-tested tight fitting negative pressure air-purifying respirator may not be worn in areas where the concentration of the air contaminant is greater than ten times the PEL.

CSHOs will be quantitatively fit tested at least annually following the procedures outlined in 1910.134, Appendix A. All CSHOs must receive a medical evaluation prior to fit testing.

- CSHOs will be allowed to pick the most acceptable respirator from a sufficient number of respirator models and sizes so that the respirator is acceptable to, correctly fits, and provides adequate protection for the user. The fitting of half-mask respirators should be started with those having multiple sizes and a variety of interchangeable cartridges and canisters.

- Prior to the selection process, the test subject will be shown how to put on a respirator, how it should be positioned on the face, how to set strap tension and how to determine an acceptable fit. A mirror will be available to assist the CSHO in evaluating the fit and positioning of the respirator. This manual does not constitute the CSHO's formal training on respirator use, because it is only a review.

- The CSHO should be informed that he/she is being asked to select the respirator that provides the most acceptable fit. Each respirator represents a different size and shape, and if fitted and used properly, will provide adequate protection.

- The CSHO should be instructed to hold each chosen facepiece up to the face and eliminate those that obviously do not give an acceptable fit.

- The more acceptable facepieces are noted in the case that the one selected proves unacceptable; the most comfortable mask is donned and worn at least five minutes to assess comfort. Assistance in assessing comfort can be given by discussing the points in the following items. If the CSHO is not familiar with using a particular respirator, he/she will be directed to adjust the mask several times and to adjust the straps each time to become adept at setting proper tension on the straps.

- Assessment of comfort will include a review of the following points with the CSHO and allowing the CSHO adequate time to determine the comfort of the respirator:

  Position of the mask on the nose;

  - Room for eye protection;
  - Room to talk;
  - Position of mask on face and cheeks.

- The following criteria will be used to help determine the adequacy of the respirator fit:

  - Chin properly placed;
  - Adequate strap tension, not overly tightened;
  - Fit across nose bridge;
  - Respirator of proper size to span distance from nose to chin;
  - Tendency of respirator to slip;
  - Self-observation in mirror to evaluate fit and respirator position.

- The CSHO will perform a user seal check, either the negative and positive pressure seal checks described below or those recommended by the respirator manufacturer which provides equivalent protection. Before conducting the negative and positive pressure checks, the CSHO will be told to seat the mask on his/her face by moving the head from side-to-side and up and down slowly while taking in a few slow deep breaths. Another facepiece should be selected and retested if the CSHO fails the user seal check tests.

  - *Positive pressure check.* Close off the exhalation valve and exhale gently into the facepiece. The face fit is considered satisfactory if a slight positive pressure can be built up inside the facepiece without any evidence of outward leakage of air at the seal. For most respirators this method of leak testing requires the wearer to first remove the exhalation valve cover before closing off the exhalation valve and then carefully replacing it after the test.

- *Negative pressure check.* Close off the inlet opening of the canister or cartridge(s) by covering with the palm of the hand(s) or by replacing the filter seal(s), inhale gently so that the facepiece collapses slightly, and hold the breath for ten seconds. The design of the inlet opening of some cartridges cannot be effectively covered with the palm of the hand. The test can be performed by covering the inlet opening of the cartridge with a thin latex or nitrile glove. If the facepiece remains in its slightly collapsed condition and no inward leakage of air is detected, the tightness of the respirator is considered satisfactory.

- *Manufacturer's recommended user seal check procedures.* The respirator manufacturer's recommended procedures for performing a user seal check may be used instead of the positive and/or negative pressure check procedures provided that it has been demonstrated that the manufacturer's procedures are equally effective.

- The test will not be conducted if there is any hair growth between the skin and the facepiece sealing surface, such as stubble beard growth, beard, mustache or sideburns which cross the respirator sealing surface. Any type of apparel which interferes with a satisfactory fit will be altered or removed.

- If a CSHO exhibits difficulty in breathing during the tests, she or he will be referred to a physician or other licensed health care professional, as appropriate, to determine whether the test subject can wear a respirator while performing her or his duties.

- If it is found that the fit of the respirator is unacceptable, the CSHO will be given the opportunity to select a different respirator and to be retested.

- Exercise regimen. Prior to the commencement of the fit test, the test subject will be given a description of the fit test and the CSHO's responsibilities during the test procedure. The description of the process will include a description of the test exercises that the CSHO will be performing. The respirator to be tested will be worn for at least 5 minutes before the start of the fit test.

- The fit test should be performed while the CSHO is wearing any applicable safety equipment that may be worn during actual respirator use which could interfere with respirator fit.

- Test Exercises. The following test exercises are to be performed for all fit testing methods. The CSHO will perform exercises, in the test environment, in the following manner:

  - NORMAL BREATHING (NB). In the normal standing position, without talking, the CSHO will breathe normally.

  - DEEP BREATHING (DB). In the normal standing position, the CSHO will breathe slowly and deeply, taking caution so as not to hyperventilate.

  - TURNING HEAD SIDE TO SIDE (SS). Standing in place, the CSHO will slowly move his/her head from side between the extreme positions to each side. The head will be held at each extreme momentarily so the CSHO can inhale at each side.

- MOVING HEAD UP AND DOWN (UD). Standing in place, the CSHO will slowly move his/her head up and down. The CSHO will be instructed to inhale in the up position (i.e., when looking toward the ceiling).

- READING (R). The CSHO will talk out loud slowly and loud enough so as to be heard clearly by the test conductor. The CSHO can read from a prepared text such as the Rainbow Passage, count backward from 100, or recite a memorized poem or song.

RAINBOW PASSAGE

When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow.

- GRIMACE (G). The CSHO will grimace by smiling or frowning. (This applies only to QNFT testing; it is not performed for QLFT)

- BENDING OVER (B). The CSHO will bend at the waist as if he/she were to touch his/her toes. Jogging in place will be substituted for this exercise in those test environments such as shroud type QNFT or QLFT units that do not permit bending over at the waist.

- NORMAL BREATHING (NB). Same as first exercise.

- Each test exercise will be performed for one minute except for the grimace exercise which will be performed for 15 seconds. The CSHO will be questioned by the test conductor regarding the comfort of the respirator upon completion of the protocol. If it has become unacceptable, another model of respirator will be tried. The respirator will not be adjusted once the fit test exercises begin. Any adjustment voids the test, and the fit test must be repeated.

- Each CSHO will be provided a copy of their fit testing results. Either a fit factor card or a copy of the results may be used for this purpose. Records of fit test results will be maintained in the Regional/Field office until the next fit test. Records will be maintained for one year from the date of the last fit test for employees who no longer are assigned to the office.

- Records of fit test results will include the information specified in 1910.134(m)(2). The information required is: the name of the CSHO, the type of fit test performed, the specific make, model, style, and size of the respirator tested, date of the test, the fit factor and strip chart recording or other recording of the test results.

- The Agency Program Administrator will be notified when a CSHO cannot be adequately fitted with a respirator.

Quantitative Respirator Fit Test (QNFT)

"Quantitative Fit Test" means an assessment of the adequacy of respirator fit by numerically measuring the amount of leakage into the respirator. Quantitative fit testing should be performed to select the best fitting respirator for CSHOs. Fit factors far exceeding practical field use needs are generally obtained from QNFT. The fit factor is only significant in terms of selecting the respirator providing the highest factor.

- General Requirements

  - Persons administering QNFT must be able to calibrate equipment and perform tests properly, recognize invalid tests, assess fit factors properly and ensure that the test equipment is in proper working order.

  - The Regional Respiratory Program Coordinator will ensure that QNFT equipment is kept clean, and is maintained according to the manufacturer's instructions so as to operate at the parameters for which it was designed.

- Instrumentation. The ambient air aerosol condensation nuclei counter (CNC) quantitative fit testing (Portacount ™ Model 8015 or any upgrades to the Model 8015) with the use of a probe will normally be used for CSHO respirator quantitative fit testing. The probed respirator is only used for quantitative fit tests. A probed respirator has a special sampling device, installed on the respirator that allows the probe to sample air from inside the mask. A probed respirator is required for each make, style, model, and size that the CSHO uses and should be obtained from the manufacturer or distributor. The CNC instrument manufacturer, TSI Inc., also provides probe attachments (TSI sampling adapters) that permit fit testing in a CSHO's own respirator. CNC quantitative fit testing utilizes ambient air as the challenge agent; therefore, no test chamber is necessary. A minimum fit factor pass level of at least 100 is necessary for a half-mask respirator and a minimum fit factor of at least 500 is required for a full facepiece negative pressure respirator. The entire screening and testing procedure will be explained to the CSHO prior to the conduct of the screening test.

- Portacount Fit Test Requirements

  - The respirator should be checked to ensure it is fitted with a high-efficiency filter and that the sampling probe and line are properly attached to the facepiece.

  - The CSHO should be instructed to don the respirator for five minutes before the fit test starts. This purges the ambient particles trapped inside the respirator and permits the wearer to make certain the respirator is comfortable. The CSHO should already have been trained on how to wear the respirator properly.

  - The following conditions should be checked for the adequacy of the respirator fit: chin properly placed; adequate strap tension not overly tightened; fit across nose bridge; respirator of proper size to span the distance from nose to chin; tendency of the respirator to slip; and self observation in a mirror to evaluate fit and respirator position.

  - The CSHO will perform a user seal check as described previously. If leakage is detected from a poorly fitting facepiece, the CSHO will try another size of the same model respirator, or another model of respirator.

- Following the manufacturer's instructions for operating the Portacount, proceed with the test.

- The CSHO will be instructed to perform the test exercises.

- After the test exercises, the CSHO will be questioned by the test conductor regarding the comfort of the respirator upon completion of the protocol. If it has become unacceptable, another model of respirator will be tried.

- Portacount Test Instrument

  - The Portacount will automatically stop and calculate the overall fit factor for the entire set of exercises. The overall fit factor is what counts. The Pass or Fail message will indicate whether or not the test was successful. If the test was a Pass, the fit test is over.

  - Since the pass or fail criterion of the Portacount is user programmable, the test operator should ensure that the pass or fail criterion meets the requirements for minimum respirator performance.

  - A record of the test needs to be kept on file in the Regional/Field office, assuming the fit test was successful. The record must contain the CSHO's name; overall fit factor; make, model, style, and size of the respirator used; and the date tested.

Qualitative Respirator Fit Test (QLFT) Protocols

"Qualitative Fit Test" means a pass/fail test to assess the adequacy of respirator fit that relies on the individual's response to the test agent. QLFT may only be used to fit test negative pressure air-purifying respirators that must achieve a fit factor of 100 or less. Dividing the fit factor of 100 by a standard safety factor of 10 indicates that the negative pressure air-purifying respirators that have successfully completed a qualitative fit test can be relied on to reduce CSHO's exposure by a protection factor of 10. The safety factor of 10 is used because protection factors that CSHOs receive at work sites tend to be much lower that the fit factors achieved during fit testing.

In practice, this means that any negative pressure air-purifying respirator may be quantitatively fit tested if the air-purifying respirator is to be used in workplace atmospheres where the level of contaminant is 10 times or less than the PEL and lower than the level that is IDLH. For example, if the PEL for a specific workplace contaminant is 5 ppm, a qualitative fit test could be used to fit test a negative pressure air-purifying respirator to be used in a workplace at exposure levels up to 50 ppm (ten times the PEL or less). If the workplace exposure level is greater than 50 ppm, however, quantitative fit testing must be done.

The Qualitative Respirator Fit Test procedures in this section will be performed to supplement quantitative fit testing to meet the annual fit testing requirements.

- General Requirements

  - Persons administering QLFT must be able to prepare test solutions, calibrate equipment and perform tests properly, recognize invalid tests, and ensure that test equipment is in proper working order.

  - QLFT equipment will be kept clean and well maintained so as to operate within the parameters for which it was designed.

  - The test will be performed using the respirator which was determined to be the most effective during the last quantitative fit test. Isoamyl acetate will be the test agent used. Individuals must be tested to ensure that they can detect isoamyl acetate. It may be necessary to use the Bitrex test, when an individual cannot detect isoamyl acetate.

- Isoamyl Acetate Protocol

Note: This protocol is not appropriate to use for the fit testing of particulate respirators. If used to fit test particulate respirators, the respirator must be equipped with an organic vapor filter.

- Odor Threshold Screening

  - Odor threshold screening, performed without wearing a respirator, is intended to determine if the individual tested can detect the odor of isoamyl acetate at low levels.

  - Three 1-liter glass jars with metal lids are required.

  - Odor-free water (e.g., distilled or spring water) at approximately 25^{o} C (77^{o} F) will be used for the solutions.

  - The isoamyl acetate (IAA) (also known as isopentyl acetate) stock solution is prepared by adding 1 ml of pure IAA to 800 ml of odor-free water in a l liter jar, closing the lid and shaking for 30 seconds. A new solution will be prepared at least weekly.

  - The screening test will be conducted in a room separate from the room used for actual fit testing. The two rooms will be well-ventilated to prevent the odor of the IAA from becoming evident in the general room air where testing takes place.

  - The odor test solution is prepared in a second jar by placing 0.4 ml of the stock solution into 500 ml of odor-free water using a clean dropper or pipette. The solution will be shaken for 30 seconds and allowed to stand for two to three minutes so that the IAA concentration above the liquid may reach equilibrium. This solution will be used for only one day.

  - A test blank will be prepared in a third jar by adding 500 ml of odor-free water.

- The odor test and test blank jar lids will be labeled (e.g., 1 and 2) for jar identification. Labels will be placed on the lids so that they can be peeled off periodically and switched to maintain the integrity of the test.

- The following instructions will be typed on a card and placed on the table in front of the two test jars (i.e., 1 and 2): "The purpose of this test is to determine if you can smell banana oil at a low concentration. The two bottles in front of you contain water. One of these bottles also contains a small amount of banana oil. Be sure the covers are on tight, the shake each bottle for two seconds. Unscrew the lid of each bottle, one at a time, and sniff at the mouth of the bottle. Indicate to the test conductor which bottle contains banana oil."

- The mixtures used in the IAA odor detection test will be prepared in an area separate from where the test is performed in order to prevent olfactory fatigue in the CSHO.

- If the CSHO is unable to correctly identify the jar containing the odor solution, the IAA qualitative fit test will not be used.

- If the CSHO correctly identifies the jar containing the odor test solution, the CSHO may proceed to respirator selection and fit testing.

- Isoamyl Acetate Fit Test

  - The fit test chamber will be a clear 55-gallon drum liner suspended inverted over a 2-foot diameter frame so that the top of the chamber is about 6 inches above the CSHO's head. If no drum liner is available, a similar chamber will be constructed using plastic sheeting. The inside top center of the chamber will have a small hook attached.

  - Each respirator used for the fitting and fit testing will be equipped with organic vapor cartridges or offer protection against organic vapors.

  - After selecting, donning, and properly adjusting a respirator, the CSHO will wear it to the fit testing room. This room will be separate from the room used for odor threshold screening and respirator selection, and will be well-ventilated, as by an exhaust fan or lab hood, to prevent general room contamination.

  - A copy of the test exercises and any prepared text from which the CSHO is to read will be taped to the inside of the test chamber.

  - Upon entering the test chamber, the CHSO will be given a 6-inch by 5-inch piece of paper towel, or other porous, absorbent, single-ply material, folded in half and wetted with the 0.75 ml of pure IAA. The CSHO will hang the wet towel on the hook at the top of the chamber. An IAA test swab or ampule may be substituted for the IAA wetted paper towel provided it has been demonstrated that the alternative IAA source will generate an IAA test atmosphere with a concentration equivalent to the generated by the paper towel method.

- Allow two minutes for the IAA test concentration to stabilize before starting the fit test exercises. This would be an appropriate time to talk with the CSHO; to explain the fit test, the importance of his/her cooperation, and the purpose for the test exercises; or to demonstrate some of the exercises.

- If at any time during the test, the subject detects the banana-like odor of IAA, the test is failed. The CSHO will quickly exit from the test chamber and leave the test area to avoid olfactory fatigue.

- If the test is failed, the CSHO will return to the selection room and remove the respirator. The CSHO will repeat the odor sensitivity test, select and put on another respirator, return to the test area and begin the fit test procedure described above. The process continues until a respirator that fits well has been found. Should the odor sensitivity test be failed, the subject will wait at least 5 minutes before retesting. Odor sensitivity will usually have returned by this time.

- If the CSHO passes the test, the efficiency of the test procedure will be demonstrated by having the CSHO break the respirator face seal and take a breath before exiting the chamber.

- When the CSHO leaves the chamber, he/she will remove the saturated towel and return it to the person conducting the test, so that there is no significant IAA concentration build-up in the chamber during subsequent tests. The used towels will be kept in a self-sealing plastic bag to keep the test area from being contaminated.

- Bitrex™ (Denatonium Benzoate) Solution Aerosol Qualitative Fit Test Protocol

The Bitrex™ (Denatonium benzoate) solution aerosol QLFT protocol uses the published saccharin test protocol because that protocol is widely accepted. Bitrex is routinely used as a taste aversion agent in household liquids which children should not be drinking and is endorsed by the American Medical Association, the National Safety Council, and the American Association of Poison Control Centers. The entire screening and testing procedure will be explained to the CSHO prior to the conduct of the screening test.

- Taste Threshold Screening

  The Bitrex taste threshold screening, performed without wearing a respirator, is intended to determine whether the individual being tested can detect the taste of Bitrex.

- During threshold screening as well as during fit testing, CSHOs will wear an enclosure about the head and shoulders that is approximately 12 inches (30.5 cm) in diameter by 14 inches (35.6 cm) tall. The front portion of the enclosure will be clear from the respirator and allow free movement of the head when a respirator is worn. An enclosure substantially similar to the 3M hood assembly, parts #14 and #15 combined, is adequate.

- The test enclosure will have a 3/4 inch (1.9 cm) hole in front of the CSHO's nose and mouth area to accommodate the nebulizer nozzle.

- The CSHO will don the test enclosure. Throughout the threshold screening test, the CSHO will breathe through his or her slightly open mouth with tongue extended. The CSHO is instructed to report when he/she detects a bitter taste.

- Using a DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent, the test conductor will spray the Threshold Check Solution into the enclosure. This Nebulizer will be clearly marked to distinguish it from the test solution nebulizer.

- The Threshold Check Solution is prepared by adding 13.5 milligrams of Bitrex to100 ml of 5% salt (NaCl) solution in distilled water.

- To produce the aerosol, the nebulizer bulb is firmly squeezed so that the bulb collapses completely, and is then released and allowed to expand fully.

- An initial ten squeezes are repeated rapidly and then the CSHO is asked whether the Bitrex can be tasted. If the CSHO reports tasting the bitter taste during the ten squeezes, the screening test is completed. The taste threshold is noted as ten regardless of the number of squeezes actually completed.

- If the first response is negative, ten more squeezes are repeated rapidly and the CSHO is again asked whether the Bitrex is tasted. If the CSHO reports tasting the bitter taste during the second ten squeezes, the screening test is completed. The taste threshold is noted as twenty regardless of the number of squeezes actually completed.

- If the second response is negative, ten more squeezes are repeated rapidly and the CSHO is again asked whether the Bitrex is tasted. If the CSHO reports tasting the bitter taste during the third set of ten squeezes, the screening test is completed. The taste threshold is noted as thirty regardless of the number of squeezes actually completed.

- The test conductor will take note of the number of squeezes required to solicit a taste response.

- If the Bitrex is not tasted after 30 squeezes, the CSHO is unable to taste Bitrex and may not perform the Bitrex fit test.

- If a taste response is elicited, the CSHO will be asked to take note of the taste for reference in the fit test.

- Correct use of the nebulizer means that approximately 1 ml of liquid is used at a time in the nebulizer body.

- The nebulizer will be thoroughly rinsed in water, shaken to dry, and refilled at least each morning and afternoon or at least every four hours.

- Bitrex Solution Aerosol Fit Test Procedure.

  - The CSHO may not eat, drink (except plain water), smoke, or chew gum for 15 minutes before the test.

  - The fit test uses the same enclosure as that described above.

- The CSHO will don the enclosure while wearing the respirator selected. The respirator will be properly adjusted and equipped with any type of particulate filter(s).

- A second DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent is used to spray the fit test solution into the enclosure. This nebulizer will be clearly marked to distinguish it from the screening test solution nebulizer.

- The fit test solution is prepared by adding 337.5 mg of Bitrex to 200 ml of a 5% salt (NaCl) solution in warm water.

- As before, the CSHO will breathe through his or her slightly open mouth with tongue extended, and be instructed to report if he/she tastes the bitter taste of Bitrex.

- The nebulizer is inserted into the hole in front of the enclosure and an initial concentration of the fit test solution is sprayed into the enclosure using the same number of squeezes (either 10, 20, or 30 squeezes) based on the number of squeezes required to elicit a taste response as noted during the screening taste.

- After generating the aerosol, the CSHO will be instructed to perform the fit test exercises.

- Every 30 seconds the aerosol concentration will be replenished using one half the number of squeezes used initially (e.g., 5, 10, or 15).

- The CSHO will indicate to the test conductor if at any time during the fit test the taste of Bitrex is detected. If the test subject does not report tasting the Bitrex, the test is passed.

- If the taste of Bitrex is detected, the fit is deemed unsatisfactory and the test is failed. A different respirator will be tried and the entire test procedure is repeated (taste threshold screening and fit testing).

- The CSHO will be given the opportunity to wear the assigned respirator for one month. If the respirator does not provide a satisfactory fit during actual use, the CSHO may request another qualitative fit test which will be performed as soon as possible.

- In addition, because the sealing of the respirator may be affected, qualitative fit testing will be repeated immediately and quantitative fit testing as soon as possible when the test subject has:

  - Weight change of 20 pounds or more,
  - Significant facial scarring in the area of the facepiece seal,
  - Significant dental changes, i.e., multiple extractions without prosthesis, or acquiring dentures,
  - Reconstructive or cosmetic surgery, or
  - Any other condition that may interfere with facepiece sealing.

Air Quality

Normally, CSHOs will not enter areas where atmosphere supplying respirators are required. When supplied air respirators are necessary, compressed air having a higher purity than Grade D, such as Grade H, or Grade I should be used. The Agency Program Administrator will coordinate deliveries with the Agency's vendor to certify that the air in the cylinders meets at a minimum, the specifications for Grade D breathing air.

Cleaning, Maintenance, and Storage

All Regional/Field Offices will establish a program for respirator cleaning and care as a part of their standard operating procedures (SOP). The purpose of this element of a respirator program is to assure that all respirators are properly maintained. If they are modified, in any way, their protection may be reduced. The Regional Respiratory Program Coordinators will be trained to inspect, clean, repair, and store respirators. The program should be based on the number and types of respirators, working conditions, and hazards involved.

In general, the program should include inspection, cleaning, repair, and storage.

- All respirators will be inspected before and after each use. The cleaning of respirators is the responsibility of the CSHO who is using the respirator, not the Regional Respiratory Program Coordinators.

- SCBAs are not expected to be routinely used by CSHOs. The Regional Respiratory Program Coordinator will ensure that any SCBAs that are used have been inspected in accordance with the requirements of 1910.134 to assure that they will perform satisfactorily.

- Air-purifying respirators

  - Thoroughly check all connections, gaskets and valves for proper fit and tightness. Check the condition of the facepiece and all its parts, and all connecting air tubes and head bands. Inspect parts, and all connecting air tubes and head bands. Inspect rubber of elastomeric parts for pliability and signs of deterioration.

  - Clean and disinfect respirators as follows:

    1) Remove all cartridges, canisters, and filters, and gaskets or seals not affixed to their seats. Cartridges will be discarded.

    2) Remove elastic head bands.

    3) Remove exhalation cover.

    4) Remove speaking diaphragm or speaking diaphragm-exhalation valve assembly.

    5) Remove inhalation valves.

6) Wash facepiece and breathing tube in cleaner/sanitizer recommended by the manufacturer with warm water, use manufacturers' recommended temperature. Wash components separately from the facepiece, as necessary. Remove heavy soil from surfaces with a hand brush.

- After respirators have been inspected, cleaned, sanitized, and repaired, store them so as to protect against dust, excessive moisture, damaging chemicals, extreme temperatures and direct sunlight.

- Each unit will be sealed in a plastic bag, placed in a separate box and tagged for immediate use.

- Cartridges and canisters will always be stored in their sealed plastic bags until ready for use. Canisters will be stored with original seals intact in the upright position.

Training

A CSHO must receive training before using a respirator. The Agency Program Administrator may provide this training or the training may be provided through completion of an OTI course in respiratory protection or other appropriate training sources. CSHOs will be encouraged to complete an OTI course in respiratory protection.

The training must cover, at a minimum, the elements specified in 1910.134(k) which include:

- Potential hazards that may be encountered at work sites and the potential consequences of not wearing a respirator.

- Discussion concerning the proper type of respirator to use in a particular environment.

- Limitations of the respirator including end-of-service-life indicators and change schedules.

- Recognition of emergency situations and actions the CSHO should take to ensure CSHO protection.

- Checking the fit of the respirator each time the respirator is worn.

- Proper maintenance and storage of the respirator.

- Checking the integrity of the respirator.

- Medical signs and symptoms that would suggest a need to limit or end usage of the respirator.

- The requirements of 1910.134.

Retraining of the CSHOs will occur at least annually or as needed in accordance with 1910.134.

5.0 Program Evaluation

The Agency Program Administrator will conduct periodic evaluations to ensure that provisions of this program are being implemented. The evaluations will include regular consultations with CSHOs who use respirators and their supervisors, site inspections, air monitoring and a review of records.

In addition, the Regional Respiratory Program Coordinators will monitor the Regional/Field offices' adherence to the procedures established in this directive. A written report detailing program effectiveness measures will be submitted to the Agency Program Administrator annually.

The following information will be included in the annual report:

- Listing by Regional/Field office by name of those quantitatively fit tested including:

    1) Current test date, quantitative fit testing (QNFT) method (Portacount or Photometric), respirator models evaluated and fit factors (FF) derived.

    2) Most recent previous quantitative fit test date, model selected and fit factors (FF) obtained.

- Resources used to administer the program including:

    1) Staff-years to perform quantitative fit testing including subject time.

    2) Staff-years to administer program which include training, evaluation and report writing.

- Comments and suggestions concerning program administration, effectiveness, technical problems relating to equipment and other relevant issues.

- Problems identified will be noted in an inspection log and addressed by the Agency Program Administrator. These finding will be reported to the Director of Occupational Health Compliance, and the report will list plans to correct deficiencies in the respirator program and target dates for implementation of those corrections.

6.0 Documentation and Recordkeeping

A written copy of this program directive and the VOSH standard is kept in each Regional/Field office and is available to all CSHOs who wish to review it.

The Office of Human Resources will maintain copies of the medical records for all CSHOs covered under the respirator program. The completed medical questionnaire and the physician's documented findings are confidential and will remain with the Department's designated health care provider. The Department will only retain the physician's written recommendation regarding each employee's ability to wear a respirator.

A summary of all fit test results will be maintained in the Regional/Field Office for seven (7) years. These records will be considered as EMPLOYEE EXPOSURE RECORDS. A copy of the summary will include:

- Name of test subject.
- Date of testing.
- Name of the test conductor.
- Fit factors obtained from every respirator tested (indicate manufacturer, model, size and approval number).
- Name and type of facepiece(s) which has failed during the qualitative test or has yielded a fit factor less than those prescribed previously.

Copies of all records will be forwarded to the Agency Program Administrator annually in the form of a computer diskette (s), with the Regional/Field Office Program Evaluation report.