

Subject:	RESPIRATORY PROTECTION PROGRAM
Section:	PPG# 4200.20
Chapter:	Operations
Effective Date:	July 1, 1998

1.0 POLICY

- 1.1 This policy outlines the components of McLane/ Black Lake Fire Department's respiratory protection program as it relates to SCBA usage, safety, testing, cleaning, training and air quality testing and related respiratory protection.
- 1.2 It is the policy of McLane/ Black Lake Fire Department to provide with the highest possible levels of Safety and Health for all members/employees. This document establishes a Departmental Respiratory Protection Program to protect the health of the employee and requires that our members use respiratory protection.
- 1.3 This program shall be updated as necessary to reflect those changes in workplace conditions that affect respirator use.
- 1.4 All members assigned to work in hazardous atmospheres shall be provided with NIOSH approved SCBA's and/or NFPA compliant respiratory protection.

2.0 DEFINITIONS

- 2.1 **ANSI.** American National Standards Institute.
- 2.2 **Confined Space.** A space that is large enough and so configured that a person can bodily enter and perform assigned work; has limited or restricted means for entry of exit (e.g., tanks, vessels, silos, storage bins, hoppers, vaults, pits): and is not designed for continuous occupancy by humans.
- 2.3 **Contaminant.** A harmful, irritating, or nuisance material that is foreign to the normal atmosphere.
- 2.4 **Facepiece** means that portion of a respirator that covers the wearer's nose and mouth and chin in a half-mask facepiece, or that covers the nose, mouth, and eyes in a full facepiece. It is designed to make a gas-tight or particle-tight fit with the face and includes the headbands, exhalation valve(s), and connections for an air-purifying device or respirable gas source, or both.

- 2.5 **Fit Check** means a test conducted by the wearer to determine if the respirator is properly seated on the face.
- 2.6 **Hazardous Atmosphere** means any atmosphere, either immediately or not immediately dangerous to life or health, which is oxygen deficient or which contains a toxic or disease producing contaminant.
- 2.7 **High Efficiency Particulate Air (HEPA)** filter means a filter which removes from the air 99.97% or more of particles having a mean diameter of 0.3 μ m.
- 2.8 **Immediately Dangerous to Life and Health (IDLH)** means any atmosphere that poses an immediate hazard to life or produces immediate irreversible debilitating effects on health.
- NIOSH** means National Institute for Occupational Safety and Health.
- 2.9 **N95** means a class of non-powered respirators certified for use in protecting against transmission of tuberculosis.
- 2.10 **Oxygen Deficiency** means an atmosphere containing less than 19.5 percent oxygen by volume or has a partial pressure of 148 millimeters of mercury or less.
- 2.11 **Respirator** means a device designed to protect the wearer from the inhalation of harmful atmospheres.
- 2.12 **SCBA.** Self-Contained Breathing Apparatus
- 2.13 **Stand-by Position.** Having all Personal Protective Clothing and SCBA donned with facepiece hanging around the neck of the wearer by the stand-by strap. The only further action required to make entry is to don the facepiece and turn on the PASS device.
- 2.14 **Vegetation Fires.** Fires burning brush, trees, branches and other natural materials in a setting that they commonly grow.
- 2.15

This section is not intended to be all inclusive of all terms contained within this policy. Further definitions can be found in NFPA 1404 *Standard for a Fire Department Self-Contained Breathing Apparatus Program*.

3.0 GUIDELINES

3.1 Situations Requiring the use of Respiratory Protection

- 3.2 Personnel shall wear the proper respiratory protection when operating in any of the following circumstances:

- 3.2.1 In a contaminated atmosphere.
 - 3.2.2 In an atmosphere that is suspected of being contaminated or oxygen deficient.
 - 3.2.3 In an atmosphere that may rapidly become hazardous or oxygen deficient.
 - 3.2.4 In an atmosphere that is oxygen deficient.
 - 3.2.5 When transporting an individual with suspected or confirmed infectious TB
- 3.3 These circumstances include:
- 3.3.1 In an active fire area.
 - 3.3.2 Directly above a fire area.
 - 3.3.3 Directly under the fire area.
 - 3.3.4 In a potential explosion or fire area.
 - 3.3.5 Where products of combustion are visible in an atmosphere, including vehicle fire and dumpster fires, but excluding vegetation fires at the discretion of the on scene incident commander.
 - 3.3.6 Where invisible contaminants are present or suspected. This includes the overhaul stage of a fire.
 - 3.3.7 Where toxic products are present, suspected of being present, or may be released without prior warning.
 - 3.3.8 In an active chemical spill area where the chemical presents an inhalation hazard.
 - 3.3.9 In any permit-required confined space that has not been tested and monitored to establish respiratory safety.
 - 3.3.10 Transporting an individual with suspected or confirmed TB in an enclosed vehicle or transporting an individual with suspected or confirmed TB within a facility whenever that individual is not masked.
- 3.4 Members using a properly functioning SCBA shall not compromise the protective integrity of the SCBA by removing the facepiece for any reason in a hazardous atmosphere or in atmospheres where the quality of the air is unknown.
- 3.5 Members using SCBA's shall operate in teams of two or more. The use of PASS devices is mandatory while using SCBA's
- 3.6 SCBA's are not SCUBA gear and are not approved or safe for that use. SCBA's shall not be used in pools or other unusual circumstances without written permission of the manufacturer.
- 3.7 Every member/employee who is being considered for inclusion in the respiratory protection program must participate in the District's medical surveillance program.
- 3.8 The District shall provide a medical evaluation to determine the member/employee's ability to use a respirator, before the member/employee is fit tested or required to use the respirator.
- 3.9 The District shall identify a physician or other licensed health care professional (PLHCP) to perform medical evaluations using the medical questionnaire in Appendix A.
- 3.10 The District shall ensure that a follow-up medical examination is provided for an employee who gives a positive response to any question among questions 1 through 8 in Part A, Section or whose initial medical examination demonstrates the need for a follow-up medical examination.

- 3.11 The follow-up medical examination shall include any medical tests, consultations, or diagnostic procedures that the PLHCP deems necessary to make a final determination.
- 3.12 All respirator users' medical status should be reviewed annually.
- 3.13 The medical questionnaire and examinations shall be administered confidentially during the member/employee's normal working hours or at a time and place convenient to the member/employee.
- 3.14 Members shall be properly fitted and tested for a face seal prior to use of the respirator in a hazardous atmosphere or contaminated area.
- 3.15 Fit test procedures and test exercises shall follow procedures detailed in Appendix B. Members will only be allowed to use the make, model, and size respirator for which they have passed a fit test within the last twelve months.
- 3.16 Qualitative or quantitative fit testing is required.
- 3.17 Fit testing shall be repeated:
 - 3.17.1 At least once every twelve months.
 - 3.17.2 Whenever there are changes in the type of SCBA or facepiece used.
 - 3.17.3 Whenever there are significant physical changes in the user. Example: Weight change of ten percent or more, scarring of face seal area, dental changes, cosmetic surgery, or any other condition that may affect the fit of the face piece seal.
 - 3.17.4 Facial hair shall not be permitted to come between the sealing periphery of the face piece and the face or interfere with the valve function of Self-Contained Breathing Apparatus, or any respirator used by the District.
 - 3.17.5 Contact lenses shall be permitted with SCBA use, provided the member's or District physician determines that the risk of eye damage is not increased by their use.
 - 3.17.6 If a spectacle, goggle, or face shield must be worn with a facepiece, it shall be worn so as to not adversely affect the seal of the facepiece to the face.
 - 3.17.7 Straps or temple bars shall not pass between the seal or surface of the respirator and the user's face.
- 3.18 Members shall be (field) decontaminated prior to removal of respirators whenever activities result in exposure to a hazardous substance. The pump operator shall establish an area to perform field decontamination and utilize water spray from a garden hose for this activity.
- 3.19 When exchanging air supply bottles during suppression or overhaul activities, reasonable precautions shall be taken to ensure contaminated atmosphere does not enter the breathing zone, face piece and regulator.
- 3.20 Anytime members are working inside a permit required confined space, they shall wear SCBA or a supplied air line respirator (SAR) with (5 min. minimum capacity) escape bottle, unless the safety of the atmosphere can be established by testing and continuous monitoring.

- Members shall be trained in the proper function, use, cleaning and maintenance of any respiratory protection provided for their use including the step-by-step procedures for putting on and removing respirators and checking it for proper function.

3.21 The required training shall cover:

- 3.22
- 3.22.1 Recognizing hazards that may be encountered.
 - 3.22.2 Understanding the components of the SCBA.
 - 3.22.3 Understanding the safety features and limitations of the SCBA.
 - 3.22.4 Inspecting and cleaning the respirator.
 - 3.22.5 Donning and doffing the SCBA/Air purifying respirator.

- Upon completion of such training, each member shall practice at least quarterly, for each type and manufacture of respirator available for use, the step-by-step procedure for donning and doffing the respirator and checking it for proper function.

- 3.23 Annual training and testing shall be conducted to the District's standard on the member/employee's knowledge of respiratory protection equipment operation, safety, district policy & procedural guidelines, and facepiece seals.

Training records shall remain part of the member's training file.

- 3.24
- 3.25 Members shall be thoroughly trained in accordance with the manufacturer's instructions on emergency procedures such as use of an SCABA regulator bypass valve, corrective action for facepiece and breathing tube damage, and breathing directly from the regulator.

- 3.26
- 3.27 No member/employee that has not received respiratory protection training, medical approval, and applicable fit testing in accordance with this policy, shall be assigned to any duty where respiratory protection is required.

- 3.28 A member shall not wear respiratory protection unless the proper size face piece is available and is inspected by the wearer to ensure the equipment is in proper working condition according to the manufacturers specification.

- 3.29 A "fit check" shall be done by the member *every* time the respirator is put on to assure that an adequate seal is achieved and that the respirator is adjusted and worn properly. Seal check procedures are listed in Appendix B.

- 3.30 Any SCBA found unstable shall be removed from service, tagged and recorded as such, and tested before being returned to service. Repair of the respirator must be done with parts designed for the respirator in accordance with the manufacturers instruction.

- 3.31 SCBA cylinders shall be hydrostatic tested within the periods specified by the manufacturer and the applicable governmental agency.

- 3.32 The SCBA cylinder air supplied by the High Pressure Air Compressor housed at Station 91 shall be tested at least quarterly to ensure it meets the requirements of ANSI/CGA G-7.1 Commodity Specification for Air, with a minimum air quality of D as well as meeting a water vapor level of 24 PPM or less

vapor level of 24 PPM or less.

- 3.33** Maintenance of the air compressor system shall be performed as recommended by the manufacturer.

- 3.34** Respirators shall be kept clean, sanitary, and in good working order. Respirators shall be cleaned and disinfected using the procedures in Appendix C of this Policy.

Respirators shall be cleaned and disinfected at the following intervals:

- 3.35**
- 3.35.1** SCBA face pieces or respirators issued for the exclusive use of a member/employee shall be cleaned and disinfected as often as necessary to be maintained in a sanitary condition.
 - 3.35.2** SCBA face pieces or respirators issued to more than one
 - 3.35.3** Member/employee shall be cleaned and disinfected before being used by different individuals.
 - 3.35.4** Face pieces and respirators used in fit testing and training shall be cleaned and disinfected before being used by different individuals.

- 3.36** The effectiveness of the respiratory program shall be evaluated annually and a written report submitted to the Chief. The written review shall follow the Program Evaluation Form in Appendix E.

- 3.37** Before any employee/member may use an air-purifying respirator, an evaluation of the respiratory hazard shall be conducted to include the contaminant's chemical state and physical form. When these cannot be identified or reasonably estimated, the District shall consider the atmosphere IDLH.

- 3.38** McLane/ Black Lake Fire Department shall maintain a complete inventory record of all SCBA.

- 3.39** Each SCBA harness assembly and cylinder shall be identified by an inventory number or serial number. An individual record of each SCBA assembly shall be maintained. Each record shall include the date of manufacture, date placed in service, location, maintenance and repairs, replacement part upgrading, and test performance.

- 3.40** A record shall be maintained for each SCBA cylinder. This record shall include the inventory or serial number, date of purchase, date of manufacture, date placed in service, location, hydrostatic test pressure and dates, and inspection and repairs.

Hydrostatic test dates shall appear on each cylinder.

- 3.41** A record shall be maintained for each SCBA facepiece. This record shall include the inventory or serial number, date of purchase, location, maintenance and repairs, replacement parts, upgrading and test performances.
- 3.42**
- 3.43** All maintenance and repairs to SCBA components shall be conducted in accordance with manufacturer's instruction by factory authorized personnel.

4.0 PROCEDURES

4.1 SCBA Inspection Procedures

4.2 SCBA carried on apparatus shall be inspected daily as follows:

4.2.2.1 Cylinder

- a) Cylinder Valve Closed
- b) Cylinder Pressure at between 4050 psi and 4500 psi.

4.2.2.2 Low pressure alarm bell.

- a) Check bell sound by pressurizing the system, open the cylinder valve and close it, the alarm should ring. Bleed off excess air.

4.2.2.3 High pressure hose.

- a) Check for tight fit at tank
- b) Check for physical damage to the hose e.g. bubbles, abrasions, or splits.

4.2.2.4 Regulator

- a) Main line knob in closed position.
- b) By-pass knob closed finger tight.
- c) Rubber outlet cover and gauge in good condition.
- d) Regulator gauge should read zero.

4.2.2.5 Backpack harness and cover

- a) Shoulder and body straps fully opened and not deteriorated.
- b) Buckles and snaps in proper working order.

4.2.2.6 Facepiece

- a) Lens clean and free of cracks.
- b) Inhalation valve tightened at facepiece.
- c) Adjustable head straps have not deteriorated.
- d) Nose cups in place and free of debris.
- e) Note any dents, cuts, or discoloration due to heat on the air cylinder.

4.3 Only those personnel who have been trained in the correct use of the SCBA fill system will be allowed to operate it.

5.0 RESPONSIBILITY

5.1 The Respiratory Program Administrator has total and complete responsibility for the supervision and administration of the Respiratory Protection Program.

- 5.2 The Respiratory Program Administrator has the authority to act under the Chief, on any and all matters of the operation and administration of the Respiratory Protection Program
- 5.3 Shift Officers shall be responsible for the condition and maintenance of SCBA's assigned to their Station.
- 5.4 Shift Officers will be responsible for the replacement of air tanks, verification of daily/weekly checks for the proper use of SCBA by members.
- 5.5 Shift officers are responsible for ensuring that they and the members of their crews are using the proper level of respiratory protection commensurate with the hazards they encounter.
- 5.6 The Program Administrator will be responsible for the purchase/procurement, assignment, and repair of SCBA.
- 5.7 The Program Administrator is responsible for maintaining air quality test records.
- 5.8 The Program Administrator shall ensure annual qualitative fit tests are made.
- 5.9 The Program Administrator is responsible for ensuring that each respirator user's medical status is reviewed annually.
- 5.10 The Training Officer shall be responsible for ensuring that an annual test is completed by each member on their knowledge of SCBA equipment operation or respiratory protection, safety, District policy & procedural guidelines, facepiece seals, and will maintain related training records.
- 5.11 The Training Officer shall be responsible for the training, testing, and requiring practice of all members/employees who will have occasion to use a respirator.
- 5.12 Incident commanders are responsible for ensuring that respiratory protection is being used properly and that the respiratory protection is appropriate for the hazards that are present or anticipated.
- 5.13 Management is responsible for:
 - 5.13.1 Identification of personnel who are required and authorized to wear respiratory protection equipment in the course of performing their duties.
 - 5.13.2 Ensuring that members/employees covered by this policy comply with all facets of this respiratory protection policy.
 - 5.13.3 The overall implementation of this policy.
 - 5.13.4 Ensuring that self-contained breathing apparatus (SCBA) are thoroughly inspected, as documented by written record, at least once per month and after each use.
 - 5.13.5 An annual evaluation of the respirator program's effectiveness.
- 5.14 Each member/employee covered by this policy shall adhere to it in the fullest extent.

- 5.15 Members shall maintain the level and proficiency of use expected by the District.
- 5.16 Members shall be responsible for maintaining SCBA and other provided respirators in sanitary and proper operating condition.
- 5.17 Members shall guard against damage to respiratory equipment.
- 5.18 Members shall be responsible for checking their SCBA as specified in the District Policy & Procedural Guidelines when coming on duty, and shall advise their officer that the unit is OK or in need of repair.
- 5.19 Employees/Members and their supervisors who fail to abide by the mandatory mask rule established for their safety shall be subject to disciplinary action.
- 5.20 An appraisal of the effectiveness of the respiratory protection program shall be carried out at least annually by the Program Administrator.

6.0 APPENDIX

- Appendix A: Medical evaluation and determination.
- Appendix B: Fit testing.
Fit checks
- Appendix C: Maintenance, care, and cleaning
- Appendix D: Training
- Appendix E: Record keeping
Program evaluation
- Appendix F: MSA Ultralite MMR Custom 4500 Instruction Manual

7.0 REFERENCES

- WAC 296-305-04001
- WAC 296-62 WAC, Part E, Respiratory Protection
- WAC 296-62 Part I-1, Asbestos, Tremolite, Anthophyllite and Actinolite
- WAC 296-842



MEDICAL EVALUATION

McLane/ Black Lake Fire Department (herein referred to as “The District”), shall provide a medical evaluation to determine the employee's ability to use a respirator, before the employee is fit tested or required to use the respirator in the workplace. The District may discontinue an employee's medical evaluations when the employee is no longer required to use a respirator.

Medical Evaluation Procedures. The District shall identify a physician or other licensed health care professional (PLHCP) to perform medical evaluations using a medical questionnaire or an initial medical examination that obtains the same information as the medical questionnaire. The medical evaluation shall obtain the information requested by the questionnaire in this section.

Follow-up Medical Examination. The District shall ensure that a follow-up medical examination is provided for an employee who gives a positive response to any question among questions 1 through 8 in Part A, section 2 or whose initial medical examination demonstrates the need for a follow-up medical examination. The follow-up medical examination shall include any medical tests, consultations, or diagnostic procedures that the PLHCP deems necessary to make a final determination.

Administration of the Medical Questionnaire and Examinations. The medical questionnaire and examinations shall be administered confidentially during the employee's normal working hours or at a time and place convenient to the employee. The medical questionnaire shall be administered in a manner that ensures that the employee understands its content. The District shall provide the employee with an opportunity to discuss the questionnaire and examination results with the PLHCP.

Supplemental Information for the PLHCP. The following information must be provided to the PLHCP before the PLHCP makes a recommendation concerning an employee's ability to use a respirator:

1. The type and weight of the respirator to be used by the employee.
 2. The duration and frequency of respirator use (including use for rescue and escape).
 3. The working conditions and expected physical work effort.
 4. The simultaneous use of required protective clothing and equipment to be worn.
 5. Temperature extremes that may be encountered.
 6. The type of work to be performed while wearing the respirator.
 7. The duration of the work with the respirator.
 8. The likelihood of rest periods while wearing the respirator.
- Any supplemental information provided previously to the PLHCP regarding an employee

need not be provided for a subsequent medical evaluation if the information and the PLHCP remain the same. The District shall provide the PLHCP with a copy of the written respiratory protection program and a copy of WAC 296-62 Part E.

When the District replaces a PLHCP, the District must ensure that the new PLHCP obtains this information, either by providing the documents directly to the PLHCP or having the documents transferred from the former PLHCP to the new PLHCP. There is no expectation that the District will have employees medically reevaluated solely because a new PLHCP has been selected.

Medical Determination. In determining the employee's ability to use a respirator, the District shall:

1. Obtain a written recommendation regarding the employee's ability to use the respirator from the PLHCP. The recommendation shall provide only the following information:
 - a. Any limitations on respirator use related to the medical condition of the employee, or relating to the workplace conditions in which the respirator will be used, including whether or not the employee is medically able to use the respirator
 - b. The need, if any, for follow-up medical evaluations.
 - c. A statement that the PLHCP has provided the employee with a copy of the PLHCP's written recommendation.

If the respirator is a negative pressure respirator and the PLHCP finds a medical condition that may place the employee's health at increased risk if the respirator is used, the District shall provide a PAPR if the PLHCP's medical evaluation finds that the employee can use such a respirator; if a subsequent medical evaluation finds that the employee is medically able to use a negative pressure respirator, then the District is no longer required to provide a PAPR.

Additional Medical Evaluations. At a minimum, the District shall provide additional medical evaluations that comply with the requirements of this section if:

1. An employee reports medical signs or symptoms that are related to ability to use a
2. respirator.
3. A PLHCP, supervisor, or the respirator program administrator informs the District that an employee needs to be reevaluated.
4. Information from the respiratory protection program, including observations made during fit testing and program evaluation, indicates a need for employee reevaluation.
5. A change occurs in workplace conditions (e.g., physical work effort, protective clothing, temperature) that may result in a substantial increase in the physiological burden placed on an employee.

Prescription Eyewear. SCBA spectacle kits and glasses shall be provided by the District if a member must wear glasses to do his/her job adequately. Contact lenses are

not prohibited in WAC 296-305. The reasons given for not wearing contact lenses however, are that with half masks, contamination could get between the pupil and the lens. Many chemicals, thus held in place, can cause irreparable damage to the eye, whereas they would not harm skin. With full-face masks, the inhaled air is directed upwards over the inside of the eyepiece of the mask to help reduce lens fogging. The incoming air, entering the facepiece, is also directed toward the eyes. A small piece of dirt or lint can easily be jetted into the eye where it could lodge behind the contact lens, causing discomfort and scratching of the pupil. The lens may also slip due to pressure on the outside corners of the eye. An eye physician should determine if an individual user's eyes would be damaged by their use with an SCBA.



RESPIRATORY MEDICAL EVALUATION QUESTIONNAIRE FOR FIREFIGHTERS

Respirator Medical Evaluation Questionnaire For Firefighters

To the employer: You must not review employee questionnaires.

To the employees: Your employer must allow you to answer this questionnaire during normal working hours, or at a time and place that is convenient to you. To maintain your confidentiality, your employer or supervisor must not look at or review your answers, and your employer must tell you how to deliver or send this questionnaire to the health care professional who will review it.

To the Employer's PLHCP: Answers to questions in Section 1, and to question 9 in Section 2 of Part A do not require a further medical evaluation.

Part A-Section 1 (Mandatory). The following information must be provided by every employee who has been selected to use any type of respirator (please print).

1. Today's Date: _____
2. Your Name: _____
3. Your Age (To Nearest Year): 4. Sex: ☐ Male ☐ Female
5. Your Height: _____ ft. _____ in.
6. Your Weight: _____ lbs.
7. Your Job Title: _____
8. Phone Number: (_____) _____
Where you can be reached by the health care professional who reviews this questionnaire.
9. Best Time to Phone You At This Number _____
10. Has your employer told you how to contact the health care professional who will review this questionnaire? ☐ Yes ☐ No
11. Check the type(s) of respirator you will use:

- ☐ N, R, or P disposable respirator (dust mask style, half-facepiece respirators without cartridges).

Check all that apply.

- ☐ Half mask ☐ Full-facepiece mask ☐ Escape ☐ Non-powered cartridge
☐ Powered air-purifying cartridge respirator (PAPR)
☐ Supplied-air or air-line
☐ Disposable filter facepiece (N-95)
☐ Self-contained breathing apparatus (SCBA)

12. Have you worn a respirator? ☐ Yes ☐ No
If yes, what type(s)? _____

Part A-Section 2 (Mandatory). Questions 1 through 9 below must be answered by every employee who has been selected to use any type of respirator. Please check "yes" or "no" for each question.

1. Do you *currently* smoke tobacco, or have you smoked tobacco in the last month? ☐ Yes ☐ No
2. Previous to three months, have you ever smoked at least ½ pack per day for a total of six months? ☐ Yes ☐ No
3. Have you ever had any of the following conditions?
 - a. Seizures (fits): ☐ Yes ☐ No
 - b. Diabetes (sugar disease): ☐ Yes ☐ No
 - c. Allergic reactions that interfere with your breathing: ☐ Yes ☐ No
 - d. Claustrophobia (fear of closed-in places): ☐ Yes ☐ No
 - e. Trouble smelling odors: ☐ Yes ☐ No
3. Have you ever had any of the following pulmonary or lung problems?
 - a. Asbestosis: ☐ Yes ☐ No
 - b. Asthma: ☐ Yes ☐ No
 - c. Chronic bronchitis: ☐ Yes ☐ No
 - d. Emphysema: ☐ Yes ☐ No
 - e. Pneumonia: ☐ Yes ☐ No
 - f. Tuberculosis: ☐ Yes ☐ No
 - g. Silicosis: ☐ Yes ☐ No
 - h. Pneumothorax (collapsed lung): ☐ Yes ☐ No
 - i. Lung cancer: ☐ Yes ☐ No
 - j. Broken ribs: ☐ Yes ☐ No
If "yes," provide dates _____
 - k. Do you feel you have completely recovered from the fracture? ☐ Yes ☐ No
 - l. Any chest injuries or surgeries: ☐ Yes ☐ No
If "yes", please describe _____
 - m. Any other lung problem that you've been told about: ☐ Yes ☐ No
 - n. Rash on the face which recurred or lasted more than one month other than acne? ☐ Yes ☐ No
If "yes", please describe _____

4. Do you currently have any of the following symptoms of pulmonary or lung illness?

- a. Shortness of breath: ☐ Yes ☐ No
- b. Shortness of breath when walking fast on level ground or walking up a slight hill or incline: ☐ Yes ☐ No
- c. Shortness of breath when walking with other people at an ordinary pace on level ground: ☐ Yes ☐ No
- d. Have to stop for breath when walking at your own pace on level ground: ☐ Yes ☐ No
- e. Shortness of breath when washing or dressing yourself: ☐ Yes ☐ No
- f. Shortness of breath that interferes with your job: ☐ Yes ☐ No
- g. Coughing that produces phlegm (thick sputum): ☐ Yes ☐ No
- h. Coughing that wakes you early in the morning: ☐ Yes ☐ No
- i. Coughing that occurs mostly when you are lying down: ☐ Yes ☐ No
- j. Coughing up blood in the last month: ☐ Yes ☐ No
- k. Wheezing: ☐ Yes ☐ No
- l. Wheezing that interferes with your job: ☐ Yes ☐ No
- m. Chest pain when you breathe deeply: ☐ Yes ☐ No
- n. Any other symptoms that you think may be related to lung problems: ☐ Yes ☐ No
5. Have you ever had any of the following cardiovascular or heart problems?
- a. Heart attack: ☐ Yes ☐ No
- b. Stroke: ☐ Yes ☐ No
- c. Angina: ☐ Yes ☐ No
- d. Heart failure: ☐ Yes ☐ No
- e. Swelling in your legs or feet (not caused by walking): ☐ Yes ☐ No
- f. Heart arrhythmia (heart beating irregularly): ☐ Yes ☐ No
If "yes", please specify _____
- g. High blood pressure: ☐ Yes ☐ No
- gi. If so, since what date? _____
- gii. Have you taken medication in the last year for this condition? ☐ Yes ☐ No
- h. Any other heart problem that you've been told about: ☐ Yes ☐ No
6. Have you ever had any of the following cardiovascular or heart symptoms?
- a. Frequent pain or tightness in your chest: ☐ Yes ☐ No
- b. Pain or tightness in your chest during physical activity: ☐ Yes ☐ No
- c. Pain or tightness in your chest that interferes with your job: ☐ Yes ☐ No
- d. In the past two years, have you noticed your heart skipping or missing a beat: ☐ Yes ☐ No
- e. Heartburn or indigestion that is not related to eating: ☐ Yes ☐ No
- f. Any other symptoms that you think may be related

- to heart or circulation problems: ☐ Yes ☐ No
7. Do you currently take medication for any of the following problems?
- a. Breathing or lung problems: ☐ Yes ☐ No
 - b. Heart trouble: ☐ Yes ☐ No
 - c. Blood pressure: ☐ Yes ☐ No
 - d. Seizures (fits): ☐ Yes ☐ No
- If so, please indicate medications:
- dii. Have medications changed in the last six months? ☐ Yes ☐ No
- 7a. Have you *ever* had an abnormal chest x-ray? ☐ Yes ☐ No
8. If you've used a respirator, have you *ever had* any of the following problems? ☐ Yes ☐ No
(If you've never used a respirator, check the following space and go to question 9). ☐
- a. Eye irritation: ☐ Yes ☐ No
 - b. Skin allergies or rashes: ☐ Yes ☐ No
 - c. Anxiety: ☐ Yes ☐ No
 - d. General weakness or fatigue: ☐ Yes ☐ No
 - e. Any other problem that interferes with your use of a respirator: ☐ Yes ☐ No
9. Would you like to talk to the health care professional who will review this questionnaire about your answers to this questionnaire? ☐ Yes ☐ No

Questions 10-15 must be answered by every employee who has been selected to use either a full-facepiece respirator or a self-contained breathing apparatus (SCBA). For employees who have been selected to use other types of respirators, answering these questions is voluntary.

10. Have you ever lost vision in either eye (temporarily or permanently)? ☐ Yes
☐ No
11. Do you currently have any of the following vision problems?
- a. Wear contact lenses: ☐ Yes ☐ No
 - b. Wear glasses: ☐ Yes ☐ No
 - c. Color blind: ☐ Yes ☐ No
 - e. Any other eye or vision problem: ☐ Yes ☐ No
If "yes", please describe and give dates:

-
-
12. Have you ever had an injury to your ears or a broken ear drum? ☐ Yes ☐ No
13. Do you currently have any of the following hearing problems?
- a. Difficulty hearing: ☐ Yes ☐ No
- b. Wear a hearing aid: ☐ Yes ☐ No
- c. Any other hearing or ear problem: ☐ Yes ☐ No
14. Have you ever had a back injury? ☐ Yes ☐ No
If "yes", please give previous date(s): _____
- 14a. If "yes", has back pain interfered with your ability to work using SCBA or full face-piece respirator? ☐ Yes ☐ No
15. Do you currently have any of the following musculo-skeletal problems?
- a. Weakness in any of your arms, hands, legs, or feet: ☐ Yes ☐ No
- b. Back pain: ☐ Yes ☐ No
- c. Difficulty fully moving your arms and legs: ☐ Yes ☐ No
- d. Pain or stiffness when you lean forward or backward at the waist: ☐ Yes ☐ No
- e. Difficulty fully moving your head up or down: ☐ Yes ☐ No
- f. Difficulty fully moving your head side to side: ☐ Yes ☐ No
- g. Difficulty bending at your knees: ☐ Yes ☐ No
- h. Difficulty squatting to the ground: ☐ Yes ☐ No
- i. Climbing a flight of stairs or a ladder carrying more than 25 lbs: ☐ Yes ☐ No
- j. Any other muscle or skeletal problem that interferes with using a respirator: ☐ Yes ☐ No
If "yes", please describe: _____
-

Part B-Section 2. Any of the following questions and other questions not listed may be added to the questionnaire at the discretion of the health care professional who will review the questionnaire.

1. At work or at home, have you ever been exposed to hazardous solvents, hazardous airborne chemicals (e.g., gases, fumes, or dust) or have you come into skin contact with hazardous chemicals? ☐ Yes ☐ No

If "yes", name the chemicals if you know them:

2. Have you ever worked with any of the materials, or under any of the conditions, listed below?

- | | | |
|---|------------------------------|-----------------------------|
| a. Asbestos: | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| b. Silica (e.g., in sandblasting): | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| c. Tungsten/cobalt (e.g., grinding or welding this material): | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| d. Beryllium: | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| e. Aluminum: | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| f. Coal (for example, mining): | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| g. Iron: | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| h. Tin: | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| i. Dusty environments: | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| j. Any other hazardous exposures: | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

If "yes", describe these exposures: _____

3. List any second jobs or side businesses you have:

4. List your previous occupations:

5. List your current and previous hobbies:

6. Have you been in the military services? ☐ Yes ☐ No

If "yes", were you exposed to biological or chemical agents (either in training or combat)? ☐ Yes ☐ No

7. Have you ever worked on a Haz-Mat team? ☐ Yes ☐ No

8. Other than medications for breathing and lung problems, heart trouble, blood pressure, and seizures mentioned earlier in this questionnaire, are you taking any other medications for any reason (including over-the-counter medications): ☐ Yes ☐ No

If "yes", name the medications if you know them:

9. Will you be using any of the following items with your respirator(s)?

a. HEPA Filters: ☐ Yes ☐ No

b. Cartridges: ☐ Yes ☐ No

10. How often are you expected to use the respirator(s)?

a. Less than 5 hours per week: ☐ Yes ☐ No

b. Less than 2 hours per day: ☐ Yes ☐ No

c. 2 to 4 hours per day: ☐ Yes ☐ No

d. Over 4 hours per day: ☐ Yes ☐ No

11. During the period you are using the respirator(s), is your work effort:

a. Light ☐ Yes ☐ No

If "yes", how long does this period last during the assignment? _____ hr _____ min.

(Example: Office type work with occasional field activity characterized by light physical exertion. Activities may include climbing stairs, standing, operating a vehicle, and long hours of work, as well as some bending, stooping, or light lifting – may include Fire Investigation or Inspection.)

b. Moderate ☐ Yes ☐ No

If "yes", how long does this period last during the assignment? _____ hr _____ min.

(Examples: Duties may include considerable working over irregular ground, standing for long periods of time, lifting or transferring a moderate load (25 to 50 pounds), climbing, bending, stooping, squatting, twisting and reaching, driving a fire apparatus.)

c. Arduous ☐ Yes ☐ No

If "yes", how long does this period last during the assignment? _____ hr _____ min.

(Example: All of the activities on an emergency scene . . . lifting and pulling heavy loads under high temperatures, climbing stairs with a heavy load [about 150 lbs.])

12. Will you be wearing protective clothing and/or equipment (other than the respirator) when you're using your respirator? ☐ Yes ☐ No

If "yes", describe this protective clothing and/or equipment: _____

13. Will you be working under hot conditions (Exceeding 77° F)? ☐ Yes ☐ No

14. Will you be working under humid conditions? ☐ Yes ☐ No

15. Describe the work you'll be doing while you're using your respirator(s): _____

16. Describe any special or hazardous conditions you might encounter when you're using your respirator(s) (*Example: Confined spaces, life-threatening gases*): _____

17. Describe any special responsibilities you'll have while using your respirator(s) that may affect the safety and well-being of others (*Example: Rescue*): _____

(Non-Mandatory) INFORMATION FOR EMPLOYEES USING RESPIRATORS WHEN NOT REQUIRED UNDER THE WAC STANDARD:

Respirators are an effective method of protection against designated hazards when properly selected and worn. Respirator use is encouraged, even when exposures are below the exposure limit, to provide an additional level of comfort and protection for workers.

However, if a respirator is used improperly or not kept clean, the respirator itself can become a hazard to the worker. Sometimes, workers may wear respirators to avoid exposures to hazards, even if the amount of hazardous substance does not exceed the limits set by WISHA standards. If your employer provides respirators for your voluntary use, or if you provide your own respirator, you need to take certain precautions to be sure that the respirator itself does not present a hazard.

You should do the following:

1. Read and heed all instructions provided by the manufacturer and the fire department use, maintenance, cleaning and care, and warnings regarding the respirators limitations.
2. Do not wear your respirator into atmospheres containing contaminants for which your respirator is not designed to protect against. For example, a respirator designed to filter dust particles will not protect you against gases, vapors, or very small solid particles of fumes or smoke.
3. Keep track of your respirator so that you do not mistakenly use someone else's respirator.

SUPPLEMENT TO MEDICAL QUESTIONNAIRE

Vital Information Sheet

Name _____

Birth Date _____

Employees Blood Pressure (both arms) _____ / _____

Recorded by: _____ Current Date: _____

PLHCP's WRITTEN RECOMMENDATION

**REPORT ON RESPIRATORY AND PROTECTION
MEDICAL EVALUATION**

Name _____ Date Evaluated _____

Position for which person evaluated

- ☐ Structural Firefighter
- ☐ Support function at emergency scene
- ☐ Support function at station
- ☐ Haz Mat team member
- ☐ Airport Firefighter
- ☐ EMT/Paramedic
- ☐ Technical Rescue Team Member,
using SCBA, Supplied Air
Respirator (SAR)

Based on the supplemental information provided by the employer, the above-named Person (Circle):

1. Is medically cleared for work using a respirator under the conditions described for the above-checked work positions, without limitations.
2. Has a medical conditon(s), which not permit this person to use a respirator.
3. Follow-up Medical Evaluation. This individual will/will not (circle one) require additional follow-up medical evaluation(s). The recommended schedule for follow-up medical evaluations, if necessary, is as follows:

Employee Notification: I certify that the above-named individual for whom this respirator clearance form is provided has received a copy of this recommendation.

Signature

Date



FIT TESTING PROCEDURES (Mandatory)

General Requirements. The District shall conduct annual fit testing using the following procedures. The requirements in this appendix apply to all WISHA accepted fit test methods.

The test subject shall be allowed to pick the most acceptable facepiece from a sufficient number of respirator sizes so that the respirator correctly fits the user.

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

The test subject shall be informed that he/she is being asked to select the facepiece that provides the most acceptable fit. Each face piece represents a different size and shape, and if fitted and used properly, will provide adequate protection.

The test subject shall 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 case the one selected proves unacceptable; the most comfortable mask is donned and worn at least five minutes to assess comfort. If the test subject is not familiar with using a particular facepiece, the test subject shall be directed to don the mask several times and to adjust the straps each time to become adept at setting proper tension on the straps.

Assistance in assessing comfort can be given by discussing the points in the following item:

Assessment of comfort shall include a review of the following points with the test subject and allowing the test subject adequate time to determine the comfort of the facepiece:

1. Position of the mask on the nose.
2. Room for eye protection.
3. Room to talk.
4. Position of mask on face and cheeks.

The following criteria shall be used to help determine the adequacy of the facepiece fit:

1. Chin properly placed.
2. Adequate strap tension, not overly tightened.
3. Fit across nose bridge.
4. Facepiece of proper size to span distance from nose to chin.
5. Tendency of facepiece to slip.
6. Self-observation in mirror to evaluate fit and facepiece position.

The test subject shall conduct a user seal check, using the negative or positive pressure seal check as described in the *User Seal and Check Procedure* on Page 4.

(Before conducting the negative or positive pressure checks, the subject shall be told to seat the mask on the face by moving the head from side-to-side and up and down slowly while taking in a few slow deep breaths. Another facepiece shall be selected and retested if the test subject fails the user seal check tests.)

The test shall 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 facepiece sealing surface. Any type of apparel which interferes with a satisfactory fit shall be altered or removed.

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

If the employee finds the fit of the facepiece unacceptable, the test subject shall be given the opportunity to select a different facepiece and to be retested.

EXERCISE REGIMEN

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

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

The following test exercises are to be performed for all fit testing methods. The test subject shall perform exercises, in the test environment, in the following manner:

Normal breathing.	In a normal standing position, without talking, the subject shall breathe normally.
Deep breathing.	In a normal standing position, the subject shall breathe slowly and deeply, taking caution so as not hyperventilate.
Turning head side to side.	Standing in place, the subject shall slowly turn his/her head from side to side between the extreme positions on each side. The head shall be held at each extreme momentarily so the subject can inhale at each side.
Moving head up and down.	Standing in place, the subject shall slowly move his/her head up and down. The subject shall be instructed to inhale in the up position (i.e., when looking toward the ceiling).
Talking.	The subject shall talk out loud slowly and loud enough so as to be heard clearly by the test conductor. The subject can read from 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.	The test subject shall grimace by smiling or frowning. (This applies only to QNFT testing; it is not performed for QLFT.)
Bending over.	The test subject shall bend at the waist as if he/she were to touch his/her toes. Jogging in place shall be substituted for this exercise in hose test environments such as shroud type QNFT or QLFT units that do not permit bending over at the waist.
Normal breathing.	Same as exercise (1).

Each test exercise shall be performed for one minute except for the grimace exercise which shall be performed for 15 seconds.

The test subject shall 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 shall be tried.

The respirator shall not be adjusted once the fit test exercises begin. Any adjustment voids the test, and the fit test must be repeated.

USER SEAL CHECK PROCEDURES (MANDATORY)

The individual who uses a tight-fitting respirator is to perform a user seal check to ensure that an adequate seal is achieved each time the respirator is put on. Either the positive and negative pressure checks listed in this appendix, or the respirator manufacturer's recommended user seal check method shall be used. User seal checks are not substitutes for qualitative or quantitative fit 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 the employer demonstrates that the manufacturer's procedures are equally effective.

SACCHARIN SOLUTION AEROSOL PROTOCOL

The entire screening and testing procedure shall be explained to the test subject prior to conducting the screening test.

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

Note: If the test subject eats or drinks something sweet before the screening test, he/she may be unable to taste the weak saccharin solution.

- (1) During threshold screening as well as during fit testing, subjects shall wear an enclosure about the head and shoulders that is approximately 12 inches in diameter by 14 inches tall with at least the front portion clear and allows free movements of the head when the respirator is worn. An enclosure substantially similar to the 3M hood assembly, parts #FT 14 and #FT 15 combined is adequate.
- (2) The test enclosure shall have a 3/4 inch (1.9 cm) hole in front of the test subject's nose and mouth area to accommodate the nebulizer nozzle.
- (3) The test subject shall don the test enclosure. Throughout the threshold screening test, the test subject shall breathe through his/her slightly open mouth with tongue extended. The subject is instructed to indicate when he/she detects a sweet taste.
- (4) Using a DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent, the test conductor shall spray the threshold check solution into the enclosure. The nozzle is to be directed away from the nose and mouth of the person being tested. This nebulizer shall be clearly marked to distinguish it from the fit test solution nebulizer.
- (5) The threshold check solution is prepared by dissolving 0.83 grams of sodium saccharin USP in 100 ml of warm water. It can be prepared by putting 1 ml of the fit test solution (see 4.2,5) below) in 100 ml of distilled water.
- (6) To produce the aerosol, the nebulizer bulb is firmly squeezed so that it collapses completely, then released and allowed to fully expand.
- (7) Ten squeezes are repeated rapidly and then the test subject is asked whether the saccharin can be tasted. If the test subject reports tasting the sweet 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.
- (8) If the first response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the saccharin is tasted. If the test

- subject reports tasting the sweet 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.
- (9) If the second response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the saccharin is tasted. If the test subject reports tasting the sweet 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.
 - (10) The test conductor will take note of the number of squeezes required to elicit a taste response.
 - (11) If the saccharin is not tasted after 30 squeezes (step 10), the test subject is unable to taste saccharin and may not perform the saccharin fit test.
 - (12) If a taste response is elicited, the test subject shall be asked to take note of the taste for future reference in the fit test.
 - (13) Correct use of the nebulizer means that approximately 1 ml of liquid is used at a time in the nebulizer body.
 - (14) The nebulizer shall be thoroughly rinsed in water, shaken dry, and refilled at least each morning and afternoon or at least every four hours.

SACCHARIN SOLUTION AEROSOL FIT TEST PROCEDURE.

- (1) The test subject may not eat, drink (except for plain water), smoke, or chew gum for 15 minutes before the test.
- (2) The fit test uses the same enclosure described in 4.1-1.
- (3) The test subject shall don the enclosure while wearing the respirator selected in Section A of this appendix. The respirator shall be properly adjusted and equipped with a particulate filter(s).
- (4) A second Devilbliss Model 40 Inhalation Medication Nebulizer or equivalent is used to spray the fit test solution into the enclosure. This nebulizer shall be clearly marked to distinguish it from the screening test solution nebulizer.
- (5) As before, the test subject shall breathe through the slightly open mouth with tongue extended, and report if she/he tastes the sweet taste of saccharin.

- (6) The nebulizer is inserted into the hole in the front of the enclosure and an initial concentration of saccharin 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 during the screening test. A minimum of ten squeezes is required.
- (7) After generating the aerosol, the test subject shall be instructed to perform the exercises listed in Appendix B of the Respiratory Protection Program.
- (8) Every 30 seconds the aerosol concentration shall be replenished using one half the original number of squeezes used initially (e.g. 5, 10, or 15).
- (9) The test subject shall indicate to the test conductor if at any time during the fit test the taste of saccharin is detected. If the test subject does not report tasting the saccharin, the test is past.
- (10) If the taste of saccharin is detected, the fit is deemed unsatisfactory and the test is failed. A different respirator shall be tried and the entire test procedure is repeated (taste threshold screening and fit testing).
- (11) Since the nebulizer has a tendency to clog during use, the test operator must make periodic checks of the nebulizer to ensure that it is not clogged. If clogging is found at the end of the test session, the test is invalid.



QUALITATIVE FIT TEST RECORD

Name:	Soc. Sec. #	Date:
Test Operator:		
Challenge Agent:		

Respirator:		NIOSH Approval#			
Model/Size:					
Fit Check:	Pass	Fail	Wear 10 Minutes:	Pass	Fail

Exercised Performed for One Minute		Pass	Fail
Normal Breathing:	No Talking.		
Deep Breathing:	Be certain breaths are deep and regular.		
Turn Head Side to Side	Inhale on each side, do not bump the respirator, do not bump the respirator against the chest.		
Move Head Up/Down:	Inhale when head is in the full up position (looking toward ceiling), do not bump the respirator against the chest.		
Read the Rainbow Passage:	Speak slowly and loudly so as to be heard clearly by the test conductor.		
Grimace:	Subject shall grimace, smile, frown and generally contort the face using the facial muscles.		
Bending, Kneeling and Lifting:	Bend at the waist and touch toes and return to to upright position. Repeat.		
Jogging in Place:	Jog in place.		
Normal Breathing:	No talking.		

Rainbow Passage:

When the light strikes the 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.



MAINTANENCE AND CARE OF RESPIRATORS

All respirators shall be inspected before each use and during cleaning.

Inspections shall include, but are not limited to, the following:

1. A check respirator function.
2. A check tightness of connections, and the condition of the various parts including, but not limited to, the facepiece, head straps, valves and connecting tube.
3. A check of elastomeric parts for pliability and signs of deterioration.
4. At each inspection, it must be determined that the regulator and warning devices function properly.

Facepieces shall be examined after each use before the SCBA is stowed. Facepieces and breathing tubes shall be inspected for defective parts. Special examination shall be made for torn, worn, or wrinkled exhalation valves, exhalation valve seats, speaking diaphragms, and high-pressure hose. Rubber and elastomer parts shall be inspected for pliability and signs of deterioration by stretching the material. Other parts shall be examined for defects. *Defective equipment shall be tagged "out of service" immediately.*

Prior to starting on the checklist, make sure that:

1. The high-pressure hose connector is tight on cylinder.
2. The bypass valve is closed.
3. The mainline valve is closed.

COMPONENT INSPECTION CHECKS (After Each Use and Monthly)

1. Don the air mask following the instruction procedures. These steps make up the Air Mask Functional Test.
2. If all steps are performed successfully, remove the air mask and inspect it following the steps below.
3. **Face Piece**
 - a. Inspect the facepiece for rubber deterioration, dirt, cracks, tears, holes or tackiness.
 - b. Check the harness headstraps for breaks, loss of elasticity, missing buckles or straps. Check the strap serrations for signs of wear.
 - c. Inspect the lens for cracks, scratches, and a tight seal with the facepiece rubber.
 - d. The exhalation valve must be clean and operate easily. The valve must move off the seat and return when released.
 - e. Inspect the facepiece coupling for damage. Also check to be sure the spider gasket, O-ring, and valve disc are present.
4. **Cylinder and Redundant Alarm Gauges**

- a. Be sure you can see both gauge needles and face clearly through the lens. Also be sure the gauge stem is not bent.
- b. Inspect the gauge hose for any visible damage.
- 5. **Audible Alarm**
 - a. Check that the bell is in the proper alignment and on tightly.
 - b. If the bell is loose, remove the alarm for service.
 - c. Unscrew the Audi-Larm coupling nut from the cylinder valve. Inspect the coupling nut for thread damage. Also be sure there is an O-ring, and that it is not damaged. It is hand-tightened and should not require tools. Replace the insert O-ring if it is damaged.
- 6. **Redundant Alarm/Pressure Gauge**
 - a. Inspect alarm for deterioration, dirt, cracks, in lens or case.
- 7. **High Pressure Hose**
 - a. Check the high-pressure hose between the alarm and the first-stage regulator. Look for cuts or severe abrasions. If present, replace the hose. The hose fitting should be tight.
- 8. **Cylinder**
 - a. Gauges on cylinders of breathing gas shall indicate content *not less than 90%* of the rated pressure stamped on the cylinder. Cylinders containing less than 90% of the rated pressure shall be either replaced by cylinders having the specified pressure or refilled in accordance with the manufacturer's specifications
 - b. Inspect the cylinder valve for signs of damage. The valve may be opened slightly to be sure it operates properly. Be sure to fully close the valve.
 - c. Inspect the cylinder body for cracks, dents, weakened areas, corrosive agents, causing the fibers to break or peel, or signs of heat-related damage.
 - d. Check the hydrostatic test date on the cylinder approval sticker located on the cylinder neck. Composite cylinders must be tested every three years.
- 9. **Harness**
 - a. Inspect all harness components for cuts, tears, abrasion or signs of heat or chemically related damage. Check that the tee nuts, washers and screws, if any are secure.
- 10. **Back Pack**
 - a. Inspect the cylinder band and latch to be sure it holds the cylinder securely. Operate the latch wind to be sure that it opens and closes properly and that it holds the cylinder securely. If the cylinder band and latch is locked, the latch wind should not turn.
 - b. Inspect back plate for cracks, weakened areas or signs of heat or chemically related damages.

FUNCTIONAL CHECKS

(After Each Use and Monthly)

1. **Check that the regulator works properly.** The regulator outlet should be sanitized

before and after testing.

- a. Check that the cylinder valve and shut-off button are closed, and that the system is not pressurized.
- b. Gently inhale through the regulator outlet and hold your breath for 10 seconds. If the negative pressure is maintained, there is no leakage.
- c. Gently exhale through the regulator outlet for about 10 seconds. If the positive pressure is maintained, there is no leakage.
- d. If air flow is detected in either test, the SCBA shall be removed from service and repaired by a certified repair person.

2. Inspect the shut-off button and by-pass valve.

- a. With a regulator pressurized, operate each valve to be sure it operates. Venting of pressure relief valves (or a continuing flow of air through the regulator when the user is not inhaling) indicates that the regulator needs to be repaired.
- b. Listen to the regulator. Any unusual sounds, such as whistling, chattering, clicking, or rattling mean that the regulator should be checked further.
- c. If any of these symptoms occur, the SCBA shall be removed from service and repaired by a certified repair person.

3. Redundant Alarm and Audible Alarm

- a. The function of the Audi-Larm and Redundant Alarm warning device should be checked by observing the regulator gauge pressure at which the alarms ring and tone. This test should be performed with a minimum of cylinder pressure of 2,000 psig.
- b. Pressurize the system by opening the cylinder valve for a moment, then close it. The alarms should ring and tone, indicating they are cocked.
- c. Open bypass slowly.
- d. Watch the drop in pressure on the redundant alarm gauge and the point at which the Audi-larm begins to ring and the redundant alarm begins to tone. The nominal gauge reading at which the alarm should start to ring is 1175 psig.
- e. The alarm should continue until the air pressure is approximately 200 psig or less. If the Audi-larm or Redundant Alarm does not function properly, the apparatus must be removed from service.

4. Test Mode of Redundant Alarm Only

- a. Verifies functioning audible and visible alarm indicators. Also check battery voltage. Accessed from sleep mode by pressing alarm switch 3 times in rapid succession. Switches to Low-battery alarm if battery voltage is low. Test mode is not available during a Low Pressure Alarm.

5. Audi-Larm Body

- a. Check that the bell is on tightly and is in the proper alignment.
- b. Close the cylinder valve completely. Be sure that nothing blocks the regulator outlet.
- c. Open the bypass valve slowly to release trapped air. Close bypass valve.

- d. Unscrew the Audi-larm coupling nut from the cylinder valve. It is hand-tight and should not require tools.
- e. Inspect the coupling nut for thread. Also be sure there is an o-ring and that it is not damaged.
- f. Replace the o-ring if it is damaged.

MANUFACTURER'S PERIODIC REBUILDING

According to the ANSI standard, the apparatus must be rebuilt by the manufacturer or by a person certified by the manufacturer at intervals specified by the manufacturer.

DOT regulations require that 3AA and 3AL cylinders undergo hydrostatic testing at least once every five (5) years.

ANNUAL INSPECTION

Complete flow and function test to manufacturer's (NFPA/NIOSH) specifications.

STORAGE

Respiratory protection devices shall be stored in their original carrying or storage cases designed for specific breathing apparatus. The SCBA shall be stored with the cylinder valves closed. Other valves should be positioned according to the manufacturer's specifications. The facepieces of all units shall be so positioned as to avoid distortion of parts during storage. Head-harness straps should be adjusted to their maximum length.

If compressed breathing air in storage is not used in three months the air should be changed

INSPECTING FIBER REINFORCED OR COMPOSITE CYLINDERS

Definitions:

Autofrettage. A pressure application procedure, which strains the metal liner past its yield point sufficient to cause permanent plastic deformation, and results in the liner having compressive stresses and the fibers having tensile stresses at zero internal pressure.

Composite. Refers to both the fibers and resin as a combined unit.

Condemned. A cylinder no longer fit for service: owner shall be notified in writing.

Exemptions. See Title 49 CFR, Section 107.101. Copies of the exemptions must be available at the retest facility.

Exterior Coating. A layer of material applied to the cylinder as a protective coating or for cosmetic purposes. This coating may be clear or pigmented. Not all cylinders will have a special exterior coating.

Fiber. The load carrying portion of the composite consisting of continuous filaments.

Fiberglass. A general term referring to glass fibers used for reinforcement.

Kevlar. An organic fiber used for reinforcement.

FRP. Fiber reinforced plastic (see Composite).

Hoop Wrap. A circumferential wrapping of fibers on the cylindrical section of a cylinder. Referred to as a "Circ" wrap.

Liner. An aluminum shell or cylinder contained within the reinforcing fibers and resin matrix.

Longitudinal Wrap. Fibers running in the general direction of the long axis of the cylinder. Referred to as a "longo" wrap.

Hoop Wrapped Cylinder. A cylinder reinforced with hoop wrap only.

Fully Wrapped Cylinder. A cylinder reinforced with both hoop and longitudinal wrap.

EXTERIOR INSPECTION OF SCBA

Exterior Inspection of SCBA Compressed Gas Cylinders

The exterior surface of a fiber reinforced cylinder does not look or feel the same as an all metal cylinder. Therefore, one should be prepared for differences in appearance and acceptance criteria.

Preparation. The cylinder should be clean, free from any dirt, labels, or attachments that would interfere with visual inspection. However, the cylinder manufacturer's label should not be removed.

INSPECTION OF FRP CYLINDERS

The visual inspection procedure for fiber reinforced cylinders is similar in many respects to that for metal cylinders. There are three (3) levels of damage that should be assessed in the following categories:

Abrasions. Scuffs - minor abrasion damage to the protective coating (i.e. paint). Abrasions greater loss of surface with numerous fibers visible. Can be caused by sliding contact with a rough surface. Flat spots evident on the surface could indicate excessive loss of composite thickness.

Cuts. Defects caused by a sharp object.

Dents or Bruises. Defects caused by blow from blunt object, may appear as crazing or frosting of the resin. (Cylinders with dents need to be hydrostatically tested before use).

Delamination. May appear as a whitish patch, like a blister or air space beneath the surface.

Structural. (A general inclusive term for severe damage.) This is extreme and may destroy the liner as well as the outer composite.

Levels of Damage

Level I Damage (Acceptable). Level I is minor and would be considered normal and have no adverse effects on the safety of the cylinder and its continued use. Such items as scratched paint, nicks or dings that have no appreciable depth, or frayed fibers are considered in this category.

Level 2 Damage (Rejectable - additional inspection or repairs required). Level 2 may be cuts or gouges which are deeper or longer than Level 1; or may include a group of severed fibers. These are repairable, but should be referred to the manufacturer for corrective action.

Level 3 Damage. Level 3 is considered unrepairable and the cylinder shall be condemned.

ACCEPTANCE CRITERIA

Abrasions

Level 1: Minor abrasions, such as scuffs, are acceptable unless the damage is deep enough to expose groups of fibers. Abrasions with isolated groups of fibers exposed or flat spots with depth less than .010" (.254mm) must be epoxy coated to avoid water entrapment. A group of fibers is defined as .010" (.254mm) thick and .125" (.3175mm) wide.

Cuts

Level 1: Cuts or scratches less than .005" (.127mm) deep are acceptable.

Level 2: Cuts with a maximum 1" (25.4mm) length transverse to the fiber direction and depth supplied by the manufacturer are repairable. Cuts should be epoxy coated with a room temperature cure system prior to hydro testing. No cut propagation is allowed after hydro-testing.

Level 3: Cylinders with cuts greater than Level 2 are condemned. Cylinders with bare metal showing through a cut in the composite shall be condemned.

Bruise. If the dent affects structural configurations, the cylinder shall be condemned. Dents or bruises existing in localized areas of the composite only, are acceptable. If the damage includes delamination or exposed fiber ends, the area must be repaired with an epoxy coating and cylinder must pass hydrostatic test.

Delaminations. Delaminations are acceptable only if repaired by coating all exposed fibers with epoxy. If delaminated area shows evidence of cut fibers or flaw growth after hydro test, the cylinder must be condemned.

Structural. Structural damage includes cylinders with visual evidence of a change in envelope configurations. A cylinder must be condemned for any evidence of bulges, cocked end fitting, concave areas on the domes or on the cylinder section, or, if by visual inspection of the cylinder interior evidence can be found of exterior damage involving deflation of the liner.

Fire Damage. Cylinders with signs of fire damage shall be condemned. Fire damage may be evident by charring or burning of the composite, labels, paint, or plastic components of the valve. If, however, the protective coating is only soiled from smoke or other debris, and is found by examination to be intact underneath, the cylinder shall not be considered affected.

Repairs. Any repairs to the composite must be compatible with the epoxy resin system and the Manufacturer should be contacted for procedures. Repairs must be accomplished prior to growth which may occur during hydrostatic testing, if such flaws grow after a repair of the composite and hydrostatic testing, the cylinders must be condemned.

Manufacturer's Labels

Manufacturer's labels are located on the sidewall near the end of the cylinder containing the valve outlet and contain the following information:

1. DOT exemption number followed by service pressure.
2. Numerical serial number followed by inspectors mark.
3. Manufacturer's identification.
4. Date of manufacture.

If the label is missing, the cylinder shall be condemned.

If label is illegible, the manufacturer should be consulted.

Special Requirements for FRP Cylinders

Hydrostatic Test (Requalifications). Cylinders shall be hydrostatically tested every three (3) years. Presently, a cylinder shall be condemned at the termination of a 15 year period following the date of manufacture.

RESPIRATOR CLEANING PROCEDURES (MANDATORY)

The procedures used here must accomplish the objectives set forth herein and must ensure that the respirator is properly cleaned and disinfected in a manner that prevents damage to the respirator and does not cause harm to the user.

Disassemble the SCBA or respirator facepieces by removing speaking diaphragms pressure-demand valve assemblies, hoses, or any components recommended by the manufacturer.

Clean the pressure demand exhalation valve by pressing in on the stem with a blunt object and flushing with clean water.

Wash components in warm (43 deg. C [120 deg. F] maximum) water with a mild detergent or with a cleaner recommended by the manufacturer. A stiff bristle (not wire) brush may be used to facilitate the removal of dirt.

Rinse components thoroughly in clean, warm (43 deg. C [120 deg. F] maximum), preferably running water. Drain.

Rinse components thoroughly in clean, warm (43 deg. C [120 deg. F] maximum), preferably running water. Drain. The importance of thorough rinsing cannot be overemphasized. Detergents or disinfectants that dry on facepieces may result in dermatitis. In addition, some disinfectants may cause deterioration of rubber or corrosion of metal parts if not completely removed.

Components should be hand-dried with a clean lint-free cloth or air-dried.

Allow the face piece to air dry. Do not dry parts by placing them near a heater or in direct sunlight.

Operate the exhalation valve by hand to be sure it works properly.

Reassemble facepiece.

Test the respirator to ensure that all components work properly.

BREATHING AIR QUALITY AND USE

The Department shall ensure that compressed air, used for SCBA cylinders meets the following specifications:

Compressed breathing air shall meet at least the requirements for Type 1-Grade D breathing air described in ANSI/Compressed Gas Association Commodity Specification for Air, G-7.1-1989, with a minimum air quality of grade D as well as meeting a water vapor level of 24 PPM or less to include:

- a. Oxygen content (v/v) of 19.5-23.5%
- b. Hydrocarbon (condensed) content of 5 milligrams per cubic meter of air or less
- c. Carbon monoxide (CO) content of 10 PPM or less
- d. Carbon dioxide content of 1,000 PPM or less
- e. Lack of noticeable odor

Cylinders of purchased breathing air have a certificate of analysis from the supplier that the breathing air meets the requirements for Type 1--Grade D breathing air; and the moisture content in the cylinder does not exceed a dew point of -65 deg.F (-45.6 deg.C) at 1 atmosphere pressure or 24 PPM.

The filter system must have a tag containing the most recent change date and the signature of the person authorized by the District to perform the change. The tag shall be maintained at the compressor.

For oil-lubricated compressors, the District shall use a high-temperature or carbon monoxide alarm, or both, to monitor carbon monoxide levels. If only high-temperature alarms are used, the air supply shall be monitored at intervals sufficient to prevent carbon monoxide in the breathing air from exceeding 10 PPM.

Identification of filters, cartridges, and canisters. The District shall ensure that all filters, cartridges and canisters used in the workplace are labeled and color coded with the NIOSH approval label and that the label is not removed and remains legible.



BREATHING AIR QUALITY TESTING RECORD

Test Performed by: _____

Phone: _____

Contact: _____

Sampled By: _____ Date Sampled: _____

Air Source ID: _____

Report Number : _____ Date Analyzed: _____

Limiting Characteristics	Source Air Results	Specification*
Oxygen		Atmospheric or 19.5-23.5%
Water/Dew point		24 PPM(v/v) /-65 ⁰ F
Oil (Condensed)		5 mg/m ³
Carbon Monoxide		10 PPM (v/v)
Odor		Pronounced**
Carbon Dioxide		1000 PPM
Other		

Notes:

*WAC 296-305-0400 (21) "Compressed gaseous breathing air in the SCBA air cylinder shall meet the requirements of ANSI/CGA G7.1 - Commodity specification for air with a minimum air quality of grade D as well as meeting a water vapor level of 24 PPM or less".

**Specific measurement of odor in gaseous air is impractical. Air normally may have a slight odor. The presence of a pronounced odor should render the air unsatisfactory.

USE OF RESPIRATORS

User Seal Check Procedures (Mandatory)

The individual who uses a tight-fitting respirator is to perform a user seal check to ensure that an adequate seal is achieved each time the respirator is put on. Either the positive and negative pressure checks listed in this appendix, or the respirator manufacturer's recommended user seal check method shall be used.

User seal checks are not substitutes for qualitative or quantitative fit tests.

Facepiece Positive and/or Negative Pressure Checks

- A. **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.
- B. **Negative pressure check.** Close off the inlet opening by covering it with the palm of the hand(s), inhale gently so that the facepiece collapses slightly, and hold the breath for ten seconds. The design of the inlet opening of some facepieces with mounted regulators cannot be effectively covered with the palm of the hand. The test can be performed by covering the inlet opening of the facepiece 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 the employer demonstrates that the manufacturer's procedures are equally effective.



TRAINING

Each member shall be trained on how to use and maintain the respiratory protection provided them. Training will include the capabilities and limitations associated with each type of respirator and the nature of the hazards which they are being protected against.

Each member must demonstrate knowledge of at least the following:

- Why the respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator.
- What the limitations and capabilities of the respirator are.
- How to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions.
- How to inspect, don and doff, use, and check the seals of the respirator.
- What the procedures are for maintenance and storage of the respirator.
- How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators.
- The requirements of WAC section 296-305-04001.
- Recognizing hazards that may be encountered.
- Understanding the components of an SCBA
- Understanding the safety features and limitations of the SCBA.

Training shall be completed prior to requiring the member to use a respirator in the workplace.

Retraining shall be administered annually, and when the following situations occur:

- Changes in the workplace or the type of respirator render previous training obsolete.
- Inadequacies in the employee's knowledge or use of the respirator indicate that the employee has not retained the requisite understanding or skill.
- Proper procedures for taking an SCBA out of service and returning it to service change.
- Any other situation arises in which retraining appears necessary to ensure safe respirator use.

After completing the above listed training each member shall practice at least quarterly for each type and manufacturers of respirator available for their use.

Members will be tested at least annually on their knowledge of SCBA equipment operations, safety, organization policies and procedures and facepiece seals to the fire departments standard.

Proof of training and instruction received must be documented using form provided.

The following topics are to be covered in the SCBA training:

- Instruction in the principles of operation of the various types and models of SCBA available for members use.
- Instruction on the construction details and limitations of each type and model available for members use.
- Instruction on the hazardous environments that *may* be encountered including
 - a. Particulate contaminants
 - b. Gas and vapor contaminants
 - c. Combinations of gas, vapor and particulate contaminant
 - d. Oxygen deficiency
- Instruction and training for the actual use of SCBA's shall include the following:
 - a. Practice of controlled breathing.
 - b. Emergency procedures.
 - c. Preventive maintenance, care and cleaning.
 - d. Practice using SCBA in simulated hostile environment.
 - f. Special problems involving the use of SCBA's:
 - 1) Low Temperatures - lenses, exhaust valves, connections, materials problems.
 - 2) High temperatures.
 - 3) Rapidly changing temperatures.
 - 4) Communications difficulties.
 - 5) Confined spaces.
 - 6) Vision.
 - 7) Facepiece-to-Face sealing problems.
 - 8) SCBA's do not provide protection from skin absorbed materials and skin irritants, ionizing radiation.

Instruction on the common causes of SCBA/SAR failure.

- a. Use and misuse of equipment
- b. Psychological and physiological limitation
- c. Unapproved equipment
- d. Buddy Breathing

TRAINING IN THE RESPIRATORY HAZARDS MEMBERS MAY BE

POTENTIALLY EXPOSED DURING ROUTINE AND EMERGENCY OPERATIONS

Chemical Contamination. Fire fighters respond to a variety of incidents each presenting its own unique hazards. Traditionally, most fire fighting activity has centered around structural fires. The combustion of wood releases several combustion products into the atmosphere, principally carbon monoxide and other simple hydrocarbons. Structural fires have changed over the past several years because building materials have changed. Polyvinyl chloride, polychlorinated biphenyl's, acrylics, phenol, polystyrene and urea-formaldehyde are components of household furniture, plastic pipes, roofing material, insulation materials, wall coverings carpets, automobiles, paints, and other construction materials and all contribute to an increased diversity of chemical products found at fires. The increased use of plastics and other synthetic materials release different kinds of combustion products, many of them highly toxic or carcinogenic.

From a blinding, suffocating work hazard, smoke now is also recognized as containing toxic fire combustion products that include:

- Carbon monoxide and carbon dioxide.
- Inorganic gases {hydrogen sulfide, hydrogen cyanide, nitrogen oxides}.
- Acid gases {hydrochloric acid, sulfuric acid, nitric acid}.
- Organic acids {formic acid, acetic acid}; chlorinated compounds {carbon tetrachloride and vinyl chloride}.
- Hydrocarbons {benzene}, Polyaromatic Hydrocarbons {PAH's}; and metals {cadmium, chromium}.
- Hydrogen Chloride.
- Phosgene.

In addition, chemicals at the site of a fire further contribute to hazardous contaminants in fire smoke. A classic example is polychlorinated biphenyl {PCBs} found in electrical transformers and other equipment which when burned may form dioxin, an acutely deadly substance.

Even the normal household will contain cleaning supplies, pesticides, pool chlorine and other substances which will contribute to release of toxic substances at fires.

Table 1.1

Examples of Fire Contaminants

Contaminant	Sources	Toxicology
Polychlorinated Biphenyl (PCBs)	Power transformers/capacitors Televisions Air Conditions Carbonless Copy Paper Hydraulic Systems Elevators	PCBs can produce dioxins which are toxic by inhalation & ingestion PCBs also absorb through the skin PCBs cause liver and pancreas
Asbestos	Roofing and Shingles Acoustic Ceiling Tiles Sprayed Ceilings Old Pipe Insulation Old Octopus Type Furnaces Pre-1975 Drywall	Principal hazard is inhalation of fibers (<microns length) causes cancer Asbestos fibers can be aerosolized from clothing and inspired or and ingested
Creosote	Power Poles Railroad Ties Treated Wood or Buildings Lumber Yards Piers and Docks	Creosotes is toxic through inhalation and skin absorption Causes cancer of skin, prostate, and testicles
Plastic Decomposition Products • Polycarbonates • Polystyrene • Polyurethane • PVC	Electrical Insulation Plumbing Furniture Construction Materials Insulation and Packaging Tools/Toys Automobiles	Variety of decomposition products including acrylonitrile, hydrogen, cyanide, nitrogen oxides, hydrogen chloride, benzene Various routes of toxicity through skin absorption, inhalation or ingestion

THE BODY'S BREATHING APPARATUS

The respiratory and circulatory cycles essential to life may be interrupted if the air supply to the lungs is inadequate or contaminated with high concentrations toxic substances. If the oxygen-rich blood cells needed by the brain are restricted or stopped, human behavior will change physically and mentally. In atmospheres slightly oxygen deficient or of lightly toxic substance, the brain signals to the other organs are slowed and behavior changes may be only slight. But in atmospheres of greater oxygen deficiency or toxicity, drastic changes in behavior will occur as brain signals to other organs stop completely. Eventually life itself will cease. Even if death does not occur, permanent organic damage to the brain tissue is possible in cases of severe hypoxia - an inadequate supply of oxygen

in the blood and lungs - for periods as short as four minutes.

Physical Effects

Physical effects can result from stress on the body in the form of the physical exertion and toxic environments encountered at the fire scene. During exercise and the exertion of fire fighting the muscle cells need more oxygen, which speeds up the heart rate and circulation. In turn, the respiration speeds up to supply the blood with more oxygen. The signs of over-exertion are fatigue, rapid breathing, dizziness, confusion and illogical thinking. Extreme effects can lead to nausea, vomiting and even unconsciousness. Fire fighting requires strength because many of the duties of a fire fighter at an emergency scene require heavy work. Handling hose and ladders, carrying victims, and ventilating buildings are a few of the tasks that require extra energy.

Adequate Warning Properties

No physiological effects in humans (e.g., odor, taste, eye irritation respiratory irritation) have been demonstrated as being capable of consistently providing respirator wearers with timely, consistent, persistent, and reliable warning of hazardous airborne concentration inside a respirator.

The effects of smoke, heat and toxic gases impair a person's ability to think and react. The effects also produce extreme discomfort. Smoke obscures a person's vision, causing a loss of bearing. Smoke irritates the eyes and causes tears, which also reduces vision. Inhaled smoke particles cause coughing, and the irritant particles are swallowed, causing nausea and vomiting. Inhaling concentrations of smoke reduces the amount of oxygen intake, causing a more rapid breathing rate, and loss of oxygen to the brain can cause dizziness. Confusion and the inability to see hamper the escape effort and prolongs the victim's exposure heat and fire gases. The effects from physical exertion at fires can be extremely unpleasant, but fire fighters must plan on facing physical stress at almost all fires. Fire fighters can protect themselves from the effects of smoke and fire gases by using self-contained breathing apparatus, but should realize there are physical consequences from wearing self-contained breathing apparatus. Tests indicate that the weight of the self-contained breathing apparatus can cause a 20 percent decrease in a fire fighter's work capacity. More strength is required to complete the tasks. However, without the use of self-contained breathing apparatus, the exertion and smoke and toxic gases will surely incapacitate a fire fighter long before the tasks can be completed.

Mental Effects

The physical properties of and conditions at the scene can cause disturbing mental effects. Oxygen deficiency is known to cause of a person's inability to reason. A person who thinks that his or actions are quite logical for the situation will in fact often act irrationally. People have been known to knock down doors to get out when all they needed to do was turn the knob. Victims have been known to fight off their rescuers. Many people even re-enter burning building for no logical reason.

Fire Toxicology and Personal protective equipment

A complete understanding of the cause of a fire fighter's death must include some

considerations of toxicological agents that may have been involved and how they may have interacted with the deceased's biological processes and systems to cause death. For instance, did the inhalation of carbon monoxide result in cardiac ischemia and subsequent cardiac arrest? Did a toxin enter the body through some route other than the respiratory system? Did protective clothing or self-contained breathing apparatus (SCBA) fail to protect the user, or was the user's air supply depleted? These conditions are often accompanied by other injuries, which may or may not themselves have caused death, such as crushing forces or prolonged exposure to high radiant heat levels.

The use of self-contained breathing apparatus (SCBA) has significantly reduced the number of fire fighter injuries and deaths that are attributable to smoke inhalation. While thermal and respiratory injuries remain a concern in cases of fire fighter autopsies, the widespread use of SCBA has introduced new considerations into the evaluation of these injuries. For example, knowing that a fire fighter's death was the result of inhalation of combustion products, when the fire fighter was using an SCBA, would indicate the need to fully evaluate the performance of the SCBA.

Table 1.2
Every Fire Fighter May Expect to Encounter:

	Where Found	I.D.	Protection	Target sites/ Diseases
Asbestos	Housing built between 1950-1967, hot insulation, pipe logging, gasket materials, transit pipe.	White or gray material. Crumbly or flaky. Be especially careful of loose, "cotton candy" type coverings on metal beams	SCBA, HEPA filter mask; asbestos can be carried home on clothes, and the hazard may spread and be persistent.	Lungs: -Mesothelioma; cancer of the linings; -asbestosis: scarring of lung tissue.
Arsenic	Common wood preservative, greenish wash or very old white paint prior to 1940.	Green or yellow tinted exterior or rough finished wood. This is very common.	Dust mask if no fire. If fire, respirator. Remember arsenic is a poison! An acute exposure could lead to serious and quick illness.	Skin rash/ulcer; liver, blood, kidney, nervous system injuries.
Benzene	2% to 10% of gasoline is benzene; it might be en- countered	A characteristic component of smoke.	Respirator	Mucous membrane irritant; nervous system depressant;

	in petroleum refining.			leukemia.
Benx(a)Pyrene	A characteristic component of smoke.	Black soot	Respirator; wash off as soon as possible.	Lung, gut, skin bladder.
Cadmium	Silver soldering solders, ceramic dyes (yellow powers), common industrial-plating and hardening.	Clear plating cyanide solution. There are many cadmium-plated metals in common use. A refrigerator shelf grill used as a barbecue grill may result in a cadmium exposure.	Respirator; wash off as soon as possible. Respirator. A flame is hot enough to cause some cadmium fumes.	Irritant of lung, mucous membrane; emphysema may result from chronic exposure; anemia.
Chlorophenols	Used as wood preservative; fence poles telephone poles. There is some evidence pentachlor in a fire will produce dioxin. TCDF.	White, needle-like crystals on surface. Look for old, not rotted wood. Wood preservative solution labeled pentachlor.	Avoid skin contact. Smoke may be more toxic than the base material	Leukemia
Chromium	Red and yellow paint and filler pigment for plastics and plating chemicals.	Brightly colored yellow, green or red powders usually in paper bags, orange to brown-red liquids in plating establishments.	Avoid skin contact. Respirator. Wash skin and clothing with soap and water after getting any on you!	Cancer of lung, nasal lining, sinuses; chrome ulcer; persistent skin ulcer due to delayed washing.
Ethylene Oxide	Sterilizing solution used in hospitals; common. Usually found as pressurized container of gas.	Heat explosion in hospital fire, or containers in transit.	Respirator.	Irritant of eyes, mucous membranes and lungs.
Formaldehyde	Common in overhaul smoke; found in mortuaries and schools. There may be very high levels in smoke of buildings with shot insulation or pressed board	Clear gas or liquid; strong, unpleasant odor.	Respirator.	Irritant of eyes, mucous membranes, lungs, skin. suspected carcinogen.

	during fire. Lower levels in these buildings even without fire.			
Orthotoluidine	Red pigment paint or plastic filler; can be found in 50 lb. paper sacks; a common material	Red, powdery pigment.	Avoid skin contact; respirator.	Liver, Kidney damage; bladder.
	Where Found	ID	Protection	Target sites/ Diseases
Polychlorinated Biphenyls (PCBs)	Transformer oils, vault and electrical pole fired, florescent light ballast explosions (older ballast's) still common, smoke may be more toxic than PCB oil PCBs in high concentration will burn to TCDF.	Oils around electrical equipment, especially non-flammable. Look for red warning sticker. A green sticker indicates a lower level of potential exposure (less than 50 PPM of oil).	Respirator: Protective clothing.	Skin: melanoma.
Vinyl Chloride	A characteristic component of smoke where a degreasing operation is involved.	Colorless liquid or gas; slightly sweet odor.	Respirator	Cancer of the liver.

Many but not all fire fighters can expect to encounter:

Acrylonitrile	Often seen in smoke where considerable urethane has been burned. May be found in college chem. labs.	Colorless liquid with pleasant odor, usually in quart bottles.	Respirator; avoid skin contact.	Lung, large intestine, prostate cancer; readily absorbed through skin.
	Formed by a	Moldy grains,	Respirator; avoid	Extremely potent

Aflatoxins	fungus which is usually associated with poor storage of certain unprocessed food products, peanuts especially.	peanuts, musty odor in stored food products.	skin contact.	carcinogen- wash well.
Alpha & Beta Naphthylamine	Lab chemicals, illegal, but common blood analysis labs.	2 oz. bottles; Appears like pink-purple glass beads.	Avoid any skin contact if bottles are broken.	Bladder cancer.
Benzidine	Lab chemical, Illegal but common in hospital blood labs and water quality labs.	Purple powder; 2 oz. bottles.	Avoid skin contact; respirator.	Bladder and kidneys; a regulated carcinogen.
Chloroform	Fairly common solvent, mostly lab and industrial.	Colorless liquid with ether-like odor; once used as an anesthetic.	Respirator	Irritant of skin, eye, lungs, mucous membrane; central nervous system depressant.
4'4, Ethylene BIS 2 (Chloroaniline) (MBOCA)	Common, plastic additive usually labeled carcinogen, urethane additive.	Yellow pellets or kernels. May be in a syrupy polyol solution.	Respirator; avoid skin contact. readily absorbed through the skin.	Cancer of the bladder; Also injures liver, lung, kidney.

Fire Fighters Are Not Likely to See:

Hydrazine	Rocket fuel.	Yellow pellets or kernels. May be in a syrupy polyol solution..	Respirator; avoid skin contact.	Pulmonary carcinogen; irritant of eyes, nose, throat.
Dioxane	Manufacturing solvent for lacquers, varnishes, paints, dyes.	Colorless liquid; pleasant odor.	Respirator; avoid skin contact.	Skin, eye, lung, liver (animal carcinogen).
Ethylenethiourea	Trace amounts in cured neoprene		Respirator; avoid skin contact.	Thyroid, liver (animal carcinogen).

	products.			
Bischloromethyl Ether	San Mateo county only.	Volatile liquid.	<i>Very dangerous! Do Not Enter.</i>	Lung cancer; regulated carcinogen.
Radioactive Materials	Heavy lead containers; industry, hospitals			

RESPIRATOR TRAINING RECORD

This certifies that the below mentioned training included the inspection procedures, fitting, maintenance and limitations of the above respirator(s) - I further certify that I

have heard the explanation of the unit(s) as described below and I understand the instructions relevant to use, cleaning, disinfecting and the limitations of the unit(s).

Trainee Signature: _____ Date _____

Trainer(s) Signature: _____ Date _____

Trainer(s)
Signature: _____ Date _____

Date _____

I certify that I have been trained in the use of the following:



RECORD KEEPING AND PROGRAM EVALUATION

Record keeping. This appendix provides direction for the District when establishing and retaining written information regarding medical evaluations, fit testing, and the respirator program. This information will facilitate member involvement in the respirator program, assist the District in auditing the adequacy of the program, and provide a record for compliance determinations by WISHA.

1. Medical evaluation. Records of medical evaluations required by this section must be retained and made available in accordance with WAC 296-62 Part E.
2. Records of fit tests administered to any member/employee will include:
 - a. The name or identification of the employee tested.
 - b. Type of fit test performed.
 - c. Specific make, model, style, and size of respirator tested.
 - d. Date of test.
 - e. The pass/fail results for the test.
3. Fit test records shall be retained for respirator users until the next fit test is administered.
4. A written copy of the current respirator program shall be retained by the employer.

1313E-1.2 RESPIRATORY PROGRAM EVALUATION

1. Have the District's written Policy and Procedural Guidelines been revised in the past year? ☐ Yes ☐ No
2. Have there been changes in the make/model of SCBA in use? ☐ Yes ☐ No
3. Has training updated lesson plans, validated annual tests? ☐ Yes ☐ No
4. Have any of the Program assignments and positions changed? ☐ Yes ☐ No
5. Have there been any changes in the Department's jurisdiction which would require any changes in respiratory hazards? ☐ Yes ☐ No
5. Are all fit test records up to date? ☐ Yes ☐ No
6. Have fit test protocols changed? ☐ Yes ☐ No
7. Have quarterly and annual test records been reviewed for Member's proficiency? ☐ Yes ☐ No
8. Has spot checks been made on members to ascertain if they are proficient on use, inspection, cleaning requirements? ☐ Yes ☐ No
9. Are the medical status records of member's current (initial, annual)? ☐ Yes ☐ No
10. Are the records of breathing air quality testing current and actions taken to correct deficiencies? ☐ Yes ☐ No

MSA Ultralite MMR Custom 4500 Instruction Manual goes here.