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Issued by:

Guideline Number: Section 2-2

Effective Date: July 2021

### Section 2-2: Self Contained Breathing Apparatus

**Purpose:** To reduce the risk of injury and illness to fire and rescue personnel while working in IDLH atmospheres and in hazardous and/or toxic atmospheres.

#### Definitions:


**Compressed Breathing Air-** must be minimum air quality Grade D as specified but the Compressed Gas Association, G-7.1, 5th edition, 2004 Commodity specification for air.

**Extend- Air Breathing Support System-** Supplemental feature on an MSA Self Contained Breathing Apparatus (SCBA) that allows a user to provide air to another user in need by hooking not a connection from the supplying firefighter's SCBA. This means that both firefighters are now breathing from one SCBA.

**Face Piece-** The respirator component that covers the wearer's nose, mouth, and in some cases the eyes. It includes the headbands, exhalation valves, and in some cases components required to connect to a breathing air supply.

**Fit Test-** The use of a protocol to qualitatively (QLFT) or quantitatively (QNFT) evaluate the fit of a respirator on an individual.

**Hazardous and/or Toxic Atmosphere-** An environment that may present or contain respiratory hazards during UH&L #33 activities,

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including but not limited to those related to overhaul, Hazardous Materials, EMS, and Fire Investigation operations.

**Immediately Dangerous to Life or Health**– An atmosphere that poses and immediate threat to life, would cause irreversible adverse health effects, or would impair an individual’s ability to escape from a dangerous atmosphere.

**N95 Respirator/ Mask**– A surgical N95 respirator mask is a NIOSH approved respirator that has also been cleared by the Food and Drug Administration (FDA) as a surgical mask that has a filter efficiency of 95% or greater against solid particulates and non-aerosols that do not degrade filter performance.


**NFPA 1404**– National Fire Protection Association Standard for Fire Service Respiratory Protection Training.

**Person Alert Safety System (PASS) Device**– A warning notification component of the Self Contained Breathing Apparatus.

**Qualitative Fit Test (QLFT)**– A subjective test that relies on an individual’s response to test the agent by his/her ability to taste or smell the challenge agent used in a pass/fail test. Used for respirators such as the N95 Respirator.

**Quantitative Fit Test (QNFT)**– An assessment of the adequacy of the respirator fit that uses numerical measurements calculated by a computer generated program and produces a numerical test result.

**Respiratory Hazard**– Any exposure to the products of combustion, superheated atmospheres, toxic gases, vapors, or dust, potentially explosive or oxygen deficient atmospheres, or any condition that creates a hazard to the respiratory system.

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


**Supplied Air Respirator (SAR)**– A device that provides air from a stationary storage cylinder through a high–pressure hose. A SAR includes an escape cylinder with at least 5 minutes of breathing air.

**Using SCBA**– Wearing and breathing air from the SCBA


**Wearing SCBA**– The user is wearing the SCBA with face piece ready for use, but not breathing air from the cylinder.

**Guideline:**

1. Requirements for Respiratory Protection
  - A. All personnel must use appropriate Respiratory Protection Equipment with an operating PASS device when operating in an IDLH atmosphere or when entering a hazardous and/or toxic atmosphere.
  - B. SCBA shall be used by all personnel who are exposed to respiratory hazards, or who may be exposed to such hazards without warning. Personnel who are operating in areas that may be subject to the hazards with sufficient warning to don SCBA shall be wearing the SCBA.
  - C. SCBA or SAR shall be worn by all personnel operating in a confined space or other atmosphere where there is a possibility of a contaminated atmosphere and shall be used until it can be deemed safe after monitoring.


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- D. Physical Requirements
- I. Members with gross facial hair as to impede the seal of the face piece or respirator shall not use respiratory protection or be placed in a position requiring respiratory protection.
  - II. Members with long hair shall be required to secure in a bun.
  - III. The use of soft contact lenses is permitted, however the use of hard contact lenses is prohibited (NFPA 1500).
- E. "Safe Atmospheres"
- I. No superheated gases
  - II. No toxic gases
  - III. No smoke beyond the density of a candle
  - IV. No active particulates (includes dust from drywall, plaster, etc.)
  - V. Meter reading of:
    1. Carbon Monoxide: <50ppm
    2. Oxygen: between 19.5% and 223%
    3. Hydrogen Sulfide: <10ppm
    4. Hydrogen Cyanide: <4.5ppm

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## 2. Operational Considerations

- A. Personnel using respiratory protection shall operate within a team of at least two people who are in contact by touch, sound, or sight at all times.
- B. Personnel shall use respiratory protection throughout the incident and even after the emergency is mitigated.
  - I. This includes stages of heavy overhaul during a structure/vehicle/dumpster fires.
  - II. N95 respirators are NOT considered approved methods of respiratory protection during structural firefighting or overhaul.
  - III. Until the atmosphere has been monitored and rendered a “safe atmosphere” as defined in Section I.E.
  - IV. With permission of the Incident Commander with consultation of the Incident Scene Safety Officer.
- C. The Incident Commander shall provide an initial stand by team and additionally means of Rapid Intervention for members making entry to an IDLH atmosphere.
  - I. The Stand By Team and Rapid Intervention Team shall be trained in the discipline of the IDLH environment.
  - II. May include a “tiered” response
    1. Initial Stand by Team or Rapid Intervention Team can be pulled from units/ personnel from the initial alarm.
    2. Full Rapid Intervention Team Response

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### 3. Rapid Intervention Group

#### D. Extended Air Breathing Support System


- I. May be used for a member to provide air to another member via the Breathing Support System Block found on the low pressure air line of the SCBA.
- II. Requirements for use:
  1. Firefighter providing must have more than half of original capacity of air in cylinder.
  2. Must be more than 100' from safe environment.
  3. Firefighter needing air must not be entangled.
  4. Must call a MAYDAY.
  5. After calling the MAYDAY, both firefighters manually activate their PASS devices and exit the building.

#### 3. Returning SCBA, SAR, and face piece units to service

- A. After each use, both prior to and after re-servicing, SCBA shall be placed on apparatus with all straps extended, all valves closed, high pressure air bled off of the system, and PASS turned off.
- B. After each use, SCBA, SAR, and face pieces should be cleaned and re-serviced in accordance with the manufactures recommendations for end users.

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4. Repair and Service
  - A. Any repairs outside of the scope of the end user per the manufacture's recommendation should be directed to a qualified maintenance person.
  - B. Batteries in the PASS devices shall be exchanged for new batteries on a semi-annual basis.
  - C. All SCBA and SAR shall have service performed and performance test conducted annually.
  - D. All SCBA cylinders shall be hydrostatically tested per the manufacture's instructions in accordance with the Department of Transportation.
  
5. Annual FIT testing
  - A. Quantitative FIT testing shall be conducted and required by operational members for the use of SCBA and SAR on an annual basis.
  - B. Qualitative FIT testing shall be conducted and required by all operational members for the use of the N95 respirator.
  - C. All FIT testing shall be performed by an authorized service technician from the manufacturer or third party.
  - D. Any member requiring a different sized of respiratory protection other than that carried on the apparatus shall be issued and responsible to care for such equipment.

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## 6. Training

- A. Members shall attend training that meets NFPA 1404 prior to using SCBA and or SAR
  - I. The importance of FIT tests.
  - II. The need for obtaining a respirator used in “fit for duty” evaluations.
  - III. Familiarity with the name and function of each portion of the SCBA.
  - IV. Demonstration and practice of the proper way to don and doff the equipment.
  - V. Recognizing and correcting perceived malfunctions during use.
  - VI. How to use the SCBA within restrictive spaces.
  - VII. How to use the SCBA during emergency situations.
  - VIII. How to use SCBA features during a Mayday.
  - IX. The situations when you should transmit a Mayday and how to do it.
  - X. Procedures to return an SCBA to service and how to refill the storage cylinder.
  - XI. Procedures to clean and disinfect the SCBA after use.



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7. Use of the N95 Respirator
  - A. Limited to environments
    - I. With a communicable disease such as tuberculosis.
    - II. In a dust filled environment not as a result of a fire
  
8. Compressor Air Quality Testing
  - A. The air quality of compressed breathing air produced by the UH&L #33 will be tested by a third party qualified testing agency on a semi-annual basis.
  - B. Records will be kept for a period of 5 years.