



CALIFORNIA STATE UNIVERSITY, FULLERTON

## **Environmental Health & Safety**

# **Self-Contained Breathing Apparatus (SCBA) Program and Procedures for SCOTT AIR-PAK 75i**

This operating procedure is based on the Manufacture Operating and Maintenance manual for the SCOTT AIR-PAK 75i. Nothing in this procedure is intended to supersede or replace the Manufacturers Operating and Maintenance manual.

This operating procedure describes the use, care, maintenance, and training relating to respiratory protective equipment in accordance with Section 5144 and ANSI Z88.2 (1980), "Practices for Respiratory Protection." This operating procedure prohibits the use of contact lenses specified in ANSI Z88.2(1980) and ANSI Z88.5(1981).

### **Policy**

These procedures are intended to be consistent with applicable requirements of California State University Fullerton (CSUF) Respiratory Protection Program.

### **Authority**

Any CSUF employee using an SCBA during the course of employee at minimum must comply with the training requirements of CCR Title 8 § 5192(e)(8) and (q)(8). Use of an SCBA by CSUF employees for the purpose of responding to emergencies that may involve employee exposure or the reasonable possibility for employee exposure to safety or health hazards must comply with the applicable sections of CCR Title 8 § 5192.

These operating procedures are not intended for structural firefighting.

### **Scope**

Emergency responders exposed to harmful exposure in the course of their assigned activities shall be provided with, and shall use respiratory protective devices that are approved and certified in accordance with CCR Title 8 § 5144, and the methods and requirements specified by the National Institute of Occupational Safety and Health (NIOSH) under 42 CFR part 84.

Respiratory protective devices provided for and used by emergency responders shall be limited to those types classified as self-contained breathing apparatus (SCBA), and combination breathing apparatus of the supplied-air positive-pressure type.

### **Definitions**

**Emergency response, or responding to emergencies:** A response effort by employees from outside the immediate release area or by other designated responders (i.e., mutual aid groups, local fire departments, etc.) to an occurrence which results, or is likely to result, in an uncontrolled release, which may cause high levels of exposure to toxic substances, or which poses danger to employees requiring immediate attention. Responses to incidental releases of hazardous substances where the substance can be absorbed, neutralized, or otherwise controlled at the time of release by employees in the immediate release area, or by maintenance personnel are not considered to be emergency responses within the scope of this standard. Responses to releases of hazardous substances where there is no immediate safety or health hazard (i.e., fire, explosion, or chemical exposure) are not considered to be emergency responses.

NOTE: The "immediate release area" can be the entire geographic boundary of the employee's assigned work area.

**Emergency situation** means any occurrence such as, but not limited to, equipment failure, rupture of containers, or failure of control equipment that may or does result in an uncontrolled significant release of an airborne contaminant.

**Interior structural firefighting** means the physical activity of fire suppression, rescue or both, inside of buildings or enclosed structures which are involved in a fire situation beyond the incipient stage. (See Article 10.1)

**Self-contained breathing apparatus (SCBA)** means an atmosphere-supplying respirator for which the breathing air source is designed to be carried by the user.

### Procedures

1. When emergency conditions require the urgent multi-person use of the same facepiece, requirements of Section 5144(h) pertaining to cleaning and sanitation of the facepiece shall not apply.
2. Respiratory protective devices provided for use by emergency responders shall have a rated service time of at least 30 minutes in accordance with the methods and requirements specified by NIOSH 42 CFR part 84.
3. Each configuration of self-contained breathing apparatus (SCBA) certified by NIOSH is assigned a "service life" classification for a duration time of each size of air supply cylinder (30 minute, 45 minute, etc.). The service life duration time is determined by NIOSH using a breathing machine designed to simulate an average adult user performing work at a "moderate work rate." Do not expect to obtain the NIOSH rated service life duration time from this respirator on each use.

Exception: Respiratory protective devices of less than 30 minutes rated service time shall only be used for escape, rescue and observation.

4. Respiratory protective devices provided for use by emergency responders shall be equipped with an automatic device that produces an audible signal to warn the user that the remaining service time of the unit has been reduced to 20-25%. Means shall be designed and incorporated to indicate to the user that his alarm has been activated.
5. The VIBRALERT alarm vibrates the breathing regulator and facepiece to warn the user by both sound and feel that approximately 25% of full cylinder pressure remains. The HEADS-UP DISPLAY lights indicate the cylinder air supply is full to three-quarters with constant green lights, one-half cylinder with a slowly flashing yellow light, and warns the user that approximately one quarter or 25% of full cylinder pressure remains with a rapidly flashing red light. The HEADS-UP DISPLAY detects cylinder pressure directly and is totally independent of the VIBRALERT. **The SCBA user must immediately leave the area requiring respiratory protection when the alarm actuates.**
6. Approved self-contained compressed air breathing apparatus may be used with approved cylinders from other approved self-contained compressed air breathing apparatus provided that such cylinders are of the same capacity and pressure rating. All compressed air cylinders used with self-contained breathing apparatus shall meet United States Department of Transportation (DOT) and NIOSH criteria. CSUF's EHS self-contained breathing apparatus are equipped with a Scott Factory "buddy-breathing" device/quick disconnect valve.

7. All compressed air self-contained breathing apparatus used in emergency response activity shall be of positive pressure type.
8. Additional protective equipment must not interfere with access to or operation of the SCBA.
9. SCBA shall not be worn when conditions prevent a good face seal. Such conditions may include, but are not limited to, growth of beards, sideburns, facial hair or low hairline that crosses or interferes with the sealing surface, thick or protruding hairstyles such as pony tails or buns that interfere with the smooth and close fit of the head harness to the head, a skull cap that projects under the facepiece, temple pieces on corrective eye glasses, excessive use of cosmetics including moisturizers, make-up, or after shave, or anything else which interferes with the face to facepiece seal.
10. See Manufacture Operation and Maintenance manual for low temperature operations and storage.
11. See Manufacture Operation and Maintenance manual for cleaning procedures of the respirator and facepiece.

### **Inspections**

Self-contained breathing apparatus shall be inspected every thirty day (30). Air and oxygen cylinders shall be maintained in a fully charged state and shall be recharged when the pressure falls to 90% of the manufacturer's recommended pressure level. The employer shall determine the regulator and warning devices function properly.

1. All SCBA maintained for use in emergency situations shall be inspected at least monthly and in accordance with the manufacturer's recommendations, and shall be checked for proper function before and after each use.
2. Visually inspect the breathing air cylinder and valve assembly for physical damage or exposure to high heat.
3. Check the latest cylinder hydrostatic test date to ensure it is current. The date of the manufacture marked on the cylinder is also the date of the first hydrostatic test.
4. Check the pressure gauge for "FULL" indication.
5. Verify that the FULL cylinder is properly installed in the backframe.
6. Verify that the reducer hose coupling is hand tightened to the cylinder valve outlet.
7. Inspect the harness for worn or damaged components.
  - a. Check all buckles and fasteners
  - b. Check cylinder retention system
8. Inspect the breathing regulator.
  - a. Inspect gasket on breathing regulator
  - b. Verify that the purge valve (red knob) is not damaged and turns smoothly
  - c. Inspect hose to the breathing regulator and quick disconnect
  - d. Verify that the quick disconnect works properly

9. Inspect the facepiece.
  - a. Inspect the facepiece seal and other rubber components
  - b. Inspect lens for any condition that could impair the operation of the facepiece or user's vision
  - c. Inspect the lens frame or bezel
  - d. Inspect all lens retainers or bezel screws
  - e. Check all harness anchors and webbing
  - f. Check of elastomeric parts for pliability and signs of deterioration.
  - g. Inspect the voicemitters, verify that it is properly installed and secure
  - h. Inspect nose cup for damage and if it is properly seated
10. Verify the SCBA has been properly cleaned.
11. If the SCBA is not damaged, perform an operational test.
  - a. Confirm the breathing regulator purge valve is closed
  - b. Fully depress the air saver/donning switch on the regulator and release
  - c. Slowly open cylinder valve (VIBRALERT alarm shall activate and then stop
  - d. HEADS-UP DISPLAY will initialize
  - e. Check the remote pressure gauge (must be within 10% of cylinder pressure gauge)
  - f. Hold facepiece to the face or don facepiece and inhale sharply to start flow of air then breath normally
  - g. Remove facepiece from face to verify free flow of breathing air
  - h. Fully depress the air saver/donning switch on regulator and release, free flow of air should stop
  - i. Examine complete SCBA air supply system for leaks
  - j. Check the purge valve by rotating  $\frac{1}{2}$  turn counterclockwise to release air
  - k. Rotate purge valve  $\frac{1}{2}$  turn clockwise to close and stop air flow
  - l. Push in and rotate the cylinder valve knob clockwise to close
  - m. After cylinder valve is closed, open purge valve slightly to vent residual air pressure from system slowly
  - n. Confirm VIBRALERT end of service indicator actuates and red light on HEADS-UP DISPLAY flashes rapidly when gauge needle crosses the  $\frac{1}{4}$  mark
  - o. Close purge valve after all residual air have been vented from the system

## **Battery Replacement**

### **Heads-Up Display**

CSUF EHS SCBAs are equipped with Heads-Up Display without PASS device, require two (2) AA batteries in the remove gauge console for operation. These batteries must be replaced every ninety days (90) or after each response the unit assigned and used.

### **EPIC Voice Amplifier**

CSUF EHS SCBAs are equipped with a voice amplification unit attached to the face mask and requires two (3) AAA batteries in the Voice Amplifier Housing, remove the battery cover using a #1 Philips Screwdriver. These batteries must be replaced every ninety days (90) or after each response the unit was assigned and used. Battery life during use is approximately twenty (2) hours.

Certify the SCBA by documenting the date the inspection was performed, the name (or signature) of the person who made the inspection, the findings, required remedial action, and a serial number or other means of identifying the inspected respirator.

Provide this information on a tag or label that is attached to the storage compartment for the SCBA, or is included in inspection reports stored as paper or electronic files. This information shall be maintained until replaced following a subsequent certification.

### **Breathing Air Quality**

CSUF is required to provide employees using atmosphere-supplying respirators (supplied-air and SCBA) with breathing gases of high purity. CSUF shall ensure that compressed air used for respiration accords with the following specifications:

1. Compressed breathing air shall meet at least the requirements for Grade D breathing air described in ANSI/Compressed Gas Association Commodity Specification for Air, G-7.1-1989, 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; and
2. Lack of noticeable odor.
3. Compressed oxygen, liquid air, and liquid oxygen are not authorized under this procedure.

CSUF shall ensure that cylinders used to supply breathing air to respirators meet the following requirements:

1. Cylinders are tested and maintained as prescribed in the Shipping Container Specification Regulations of the Department of Transportation (49 CFR 173 and part 178);
2. Cylinders of purchased breathing air have a certificate of analysis from the supplier that the breathing air meets the requirements for Grade D breathing air; and
3. The moisture content in the cylinder does not exceed a dew point of -50 deg. F (-45.6 deg. C) at 1 atmosphere pressure.

### **Donning**

1. Verify that the cylinder gauge for a "FULL" indication and cylinder is held securely by the retention assembly.
2. Release any restraints or straps holding SCBA in place in storage case.
3. Spread shoulder straps and unfold waist belt. Stand the SCBA assembly on cylinder valve with cylinder toward you. Holding the shoulder straps swing the SCBA around and behind you as if donning a coat.
4. While leaning slightly forward, adjust shoulder straps to settle the SCBA in position on the back. Connect the waist belt and adjust. Tuck the belt ends into the waistband.
5. Stand up straight and adjust the shoulder straps as needed to ensure the weight of the backframe is carried on the hips.
6. Adjust facepiece head straps to their full outward position. Hold facepiece in one hand, place the facepiece on the face and use the other hand to tighten the neck straps then pull the head harness over and down the back of the head. Retighten neck straps then tighten two temple straps.
7. Fully depress air saver/donning switch on breathing regulator and release.

8. Inspect breathing regulator before inserting the regulator into the facepiece port. Align corresponding flats in facepiece port with regulator and insert regulator. Turn regulator counter clockwise to lock into facepiece retainer, lock tab will lock into place with a “click.”
9. Slowly open cylinder valve by turning valve knob counter clockwise until it stops. The VIBRALERT end of service indicator alarm will actuate and then stop.
10. Inhale sharply to actuate SCBA.
11. Always check facepiece seal and end of service alarm by completely closing cylinder valve and continue breathing. As the air pressure falls, the VIBRALERT end of service indicator alarm will actuate.
12. Resume breathing until all air stops flowing from breathing regulator then inhale and hold breath momentarily. No leakage of air shall be detected into the facepiece and facepiece shall be drawn slightly to the face.
13. Open cylinder valve and breathe normally.

### **SCBA Use**

1. Put on any other required protective head gear or protective clothing. Be sure that any head gear, helmet or protective clothing does not interfere with the use of the respirator. The head must move freely without dislodging the facepiece or disturbing the face to facepiece seal.
2. Periodically check the remote pressure gauge on the shoulder strap to monitor rate of air consumption and remaining air supply. Always allow enough air supply to egress from the contaminated area.
3. If the air supply is partially or completely cut off during use, fully open the red purge valve on the regulator by turning it counterclockwise and check to be sure the cylinder valve is fully opened. LEAVE THE CONTAMINATED AREA AT ONCE AFTER OPENING THE PURGE VALVE.
4. **The SCBA user must immediately leave the area requiring respiratory protection when the VIBRALERT end of service alarm actuates.**
5. To terminate use of SCBA, leave contaminated area or be certain respiratory protection is no longer required. Loosen temple straps and neck straps on facepiece while lifting facepiece away from face. To stop air flow from the facepiece, fully depress the air saver/donning switch on the regulator and release.
6. Close the cylinder valve.
7. Slightly loosen shoulder straps and release waist belt and remove the unit from your back.
8. Replace air cylinder in accordance with CYLINDER REPLACEMENT PROCEDURE in the manufacture operating and maintenance manual.
9. If there is a malfunction or suspected malfunction during use, remove the SCBA from service and tag for repair by authorized personnel.

## **Storage**

1. Verify breathing regulator is thoroughly dry before placing in storage.
2. Connect regulator to facepiece.
3. Place clean and dry facepiece in a sealable enclosure. Store facepiece in a manner that will not distort the face seals.
4. Place SCBA in carrying case or other protective container.
5. Special considerations shall be made for securing SCBA units and related equipment kept in vehicles to minimize the possibility of injury to persons in or near the vehicle during movement, rapid acceleration or deceleration, sharp turns or an accident.