BREATHING APPARATUS

SAN FRANCISCO FIRE DEPARTMENT
FOREWORD

The goal of this manual is to establish standard operating practices as authorized by the Chief of Department and implemented by the Division of Training.

The purpose of this manual is to provide all members with the essential information necessary to fulfill the duties of their positions, and to provide a standard text whereby company officers can:

- Enforce standard drill guidelines authorized as a basis of operation for all companies.
- Align company drills to standards as adopted by the Division of Training.
- Maintain a high degree of proficiency, both personally and among their subordinates.

All manuals shall be kept up to date so that all officers may use the material contained in the various manuals to meet the requirements of their responsibility.

Conditions will develop in fire fighting situations where standard methods of operation will not be applicable. Therefore, nothing contained in these manuals shall be interpreted as an obstacle to the experience, initiative, and ingenuity of officers in overcoming the complexities that exist under actual fire ground conditions.

To maintain the intent of standard guidelines and practices, no correction, modification, expansion, or other revision of this manual shall be made unless authorized by the Chief of Department. Suggestions for correction, modification or expansion of this manual shall be submitted to the Division of Training. Suggestions will be given due consideration, and if adopted, notice of their adoption and copies of the changes made will be made available to all members by the Division of Training.

Joanne Hayes-White
Chief of Department
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Self contained breathing apparatus (SCBA) is one of the most important pieces of equipment used by firefighters. Breathing apparatus permit firefighters to enter areas deficient in oxygen and or contaminated by smoke, noxious or poisonous gases. It enables firefighters to perform their duties of fire suppression and rescue with greater safety.

Proper use of breathing apparatus offers many advantages, such as hastening rescue work, protecting fire fighting personnel, size up and extinguishment, and minimizing water damage. In many instances the use of breathing apparatus will enable firefighters to gain access to areas that would be otherwise inaccessible.

All breathing devices should be used within their limitations; it is of vital importance to know these limitations. To be proficient, Department members should be thoroughly trained and frequently evaluated in the use and care of breathing apparatus.

Training Bulletins and specific rules have been incorporated into this manual to emphasize the importance of all breathing apparatus and its proper use.

GENERAL INFORMATION

Leave it on

For years, fire training personnel have spent many hours instructing firefighters in the proper use and care of breathing apparatus. Almost every one today realizes that it is foolish and also in violation of the Rules to challenge a fire situation in confined spaces without respiratory protection.

It has long been known that breathing apparatus is one of the few pieces of equipment carried on fire apparatus solely for the protection of the firefighter. During many hours of training, firefighters have become proficient in the use of breathing apparatus. Know its limitations and govern yourselves accordingly.

One area that many firefighters do not consider and which can be extremely dangerous is taking the mask off too soon after a fire has been controlled. It is only natural to want to get rid of the weight and the confinement of the facepiece as soon as possible, but how many times do we pull the facepiece off before sufficient ventilation is achieved?

If we agree that the breathing apparatus will give us the best respiratory protection available, then what makes the difference between wearing it on entry and pulling it off too soon after a fire has been extinguished? How can we logically assume that simply
because the fire is no longer raging that we have no concentrations of noxious by-products of combustion in the building? There is no way that we can assume that noxious gases are no longer in the atmosphere immediately after extinguishing a fire or prior to adequate and sufficient ventilation. But firefighters still remove the facepiece and the breathing apparatus at the first opportunity. The absence of visible products of combustion does not necessarily indicate that the toxic products of combustion have dispersed.

Many hours of study are devoted to determine what can be expected in the way of gases and noxious by-products that result from fire in confined areas. Nitrates, asbestos, plastics, sulfurs, chlorides, cyanides, etc., are present and most firefighters know this. So why do firefighters insist on discarding the breathing apparatus as soon as we do, while often remaining in the fire area for extended periods before the building is cleared? Remember the three small words that might mean a big difference in your life—*LEAVE IT ON!*

Immediate superiors, Safety Officers, and Chief Officers shall be responsible for compliance with all rules governing the use of breathing apparatus.

**SCBA AND MANDATORY MASK RULE**

1. Through field testing it has been proven that the time it actually takes to don a SCBA is minimal. The intent of the SCBA Rule is for all members responding to a possible fire or hazardous materials incident to don SCBA prior to entering a building or encountering a hazardous atmosphere.

2. SCBA **shall be donned** by members when they arrive at an incident to perform firefighting duties. This includes the investigating stage of that incident. Facemasks **must** be donned before encountering any type of toxic, contaminated, or unknown environment. There may be a rescue operation or outside fire duty that should be performed with SCBA.

3. Members using SCBA in toxic or contaminated areas **shall always work in pairs.**

4. There may be times when SCBA may cause a safety hazard, such as raising ladders, working on peaked roofs, working with heavy tools, or where there is an unstable footing.

5. **NEVER ATTEMPT TO JUMP WHILE WEARING AN SCBA.** The air cylinder rests high on the user’s back. One’s head naturally snaps backward when landing. This could cause serious injury to one’s head.

6. Even though a fire has been extinguished, the surrounding atmosphere may still be toxic. Members **shall continue** to use the SCBA until the environment is deemed safe by their immediate superior, Safety Officer or Chief Officer.
7. When masks are removed, they shall not be dropped or left in a building or other area where they will be subjected to damage. One member will be assigned by the company officer to carry the breathing apparatus outside and safely place them on the apparatus.

8. The use of breathing apparatus does not lessen the importance of prompt and proper ventilating procedures.

9. It should be stressed that where injuries occur, and where negligence and/or failure to use proper safeguards are observed, the immediate superior and the injured firefighter may be held responsible by Cal/OSHA.

10. When a Form 5020 or Form 3807 Injury Report is submitted for any member suffering from smoke inhalation or any other inhalation injury, a separate report shall accompany the injury report explaining why and how the firefighter was subjected to such an injury.

11. Immediate superiors and chief officers shall be responsible for compliance with this rule.

**Facial Hair and Respirator Use**

General Industry Safety Order 5144 —Title 8, California Administrative Code specifies, “Respirators shall be inspected before each use and shall not be worn when conditions prevent a good gas-tight face seal”.

Studies indicate that the presence of facial hair can greatly reduce the protection factor of a respirator by allowing leakage to occur.

Firefighters must deal with exposures that are immediately dangerous to life and health (IDLH). Protection from these exposures is through a good, tight face seal on the SCBA mask.

Members can find this policy in the Rules & Regulations, Article 39.

**Protection from Skin Irritants**

Self contained breathing apparatus will not protect the wearer from all toxic materials. HazMat incidents can release substances which can be toxic to fire fighters in full structural protective wear.

It is not always immediately obvious that hazardous materials are present at the scene of an emergency. Many chemicals can do tremendous harm long before you detect their presence.

If hazardous materials are suspected, station uniform or PPE may not and in many cases, will not provide protection against skin absorption. Once hazardous materials are detected, isolate the area and deny entry, and call for the HazMat Unit located at Station 36. The HazMat Unit carries Level 1 encapsulated suits and Level 2 splash
suits designed to protect members from possible injury or death from hazardous materials which can be absorbed through the skin.

Remember, HazMat incidents differ from other emergencies in that you must act slowly and methodically.

ALWAYS THINK SAFETY!!!!
SECTION 2. SCOTT 4.5 SELF-CONTAINED BREATHING APPARATUS

DESCRIPTION

The ScottPresur-Pak* 4.5 (60 minute, 45 minute, and 30 minute) self-contained breathing apparatus is a respirator designed to provide mobility while providing approximately 30 minutes, 45 minutes or 60 minutes of breathable air depending upon cylinder size. At present, the SFFD utilizes the 30 minute, 45 minute, and the 60 minutes air cylinders. The respirator provides the user with respiratory protection while performing fire fighting and/or rescue in objectionable, oxygen deficient and/or unbreatheable (toxic) atmospheres. This respirator is not to be used for purposes other than authorized by the Department. 

This respirator must not be used underwater.

The respirator consists of a cylinder and valve assembly for storing compressed breathing air, a harness and back frame assembly to support the equipment on the body of the wearer, a face piece assembly, a positive pressure face piece-mounted breathing regulator and a redundant dual-path pressure reducing regulator mounted on the back frame.

The breathing regulator is equipped with a donning switch which can be activated to prevent rapid loss of air supply if the system is turned on prior to donning the face piece or if the face piece is removed while in service. The breathing regulator is also equipped with an end-of service alarm. The alarm vibrates to warn the user of diminished air supply by both sound and feel. The pressure reducing regulator has no manual by-pass control. Instead it uses a redundant dual path reducing system. The secondary system automatically supplies air if the primary system fails. When the secondary is in operation, the alarm is also actuated to warn the user that the primary system has malfunctioned.
SERVICE LIFE

The Scott Presur-Pak 4.5 is rated and approved by NIOSH/MSHA as a 60, 45, or 30 minute duration unit depending on the cylinder and valve assembly utilized when properly donned, used and maintained by trained personnel. An alarm actuates when approximately 20-25% of the rated service time remains. The alarm will continue to operate until the cylinder is nearly depleted.

The user should not expect to obtain exactly the 60, 45, or 30 minutes rated service life from the respirator on each use. In most cases, duration is much shorter. The work may be more strenuous than that used in the NIOSH/MSHA tests. Where work is more strenuous, the duration may be shorter, possibly as much as one-half the rated service life. Likewise, the time remaining after the alarm actuates will be similarly reduced.

The duration of the respirator will depend on such factors as:

- The degree of training or experience which the user has with this or similar equipment
- The physical condition of the user
- The degree to which the user's breathing is affected by excitement, fear, or stress
- Whether or not the cylinder is fully charged at the start of work period
- The possible presence in the compressed air of carbon dioxide concentrations greater than 0.04% (normally found in atmospheric air).
- The degree of physical activity involved
- Condition of the respirator
- If used in a pressurized tunnel or caisson the rate of duration will be reduced

SCOTT 4.5 CYLINDER

1. Aluminum cylinder
2. Fully over-wrapped with fiberglass or Kevlar
3. Hydrostatic tested every 3 or 5 years.
   - 3 Years Yellow SCBA cylinders
   - 5 Years Tan/Silver SCBA cylinders
4. Pressurized to 4500 psi (the 60 minute, 45 minute and 30 minute SAP 4.5 bottle are all pressurized to the same PSI —4500)
5. Elastomeric bumper
6. Can be used to supply air for tools ONLY with the use of a special adapter.
Note: The Scott 2A aluminum cylinder is carried on companies for use with air powered tools and is pressurized to a maximum of 2216 psi. **It is not to be used as a breathing apparatus cylinder under any circumstances.**

Figure 2—Scott 2A (Note the flat bottom)

**NOTE 15-YEAR LIFESPAN ON ALL AIR CYLINDERS**

**BREATHING REGULATOR**

1. Connects and disconnects to face piece by means of a quarter turn coupling and latches in place.

2. Air saver switch (donning switch)
   a. Activated by depressing the center of the switch
   b. Activation prevents rapid loss of air supply if the system is turned on prior to donning

3. Also, activation prevents rapid loss of air supply when removing the face piece from your face while the cylinder valve is open

4. Vibralert
   a. Alarm sounds and vibrates to warn user of diminishing air supply
   b. Alarm actuates when approximately **20-25%** of the service time remains (about 1,000 psi).
      - This alarm indicates you have used up ¾ of your air supply; the alarm will continue to operate until the cylinder is nearly depleted.
   c. The alarm may also actuate to warn you that the breathing circuit has malfunctioned.
   d. You can identify you own alarm by sensing the vibrations through your facepiece.
Department regulations require that you and your partner leave the contaminated area immediately upon activation of either/or both parties Vibralert.

5. Breathing Regulator Purge Valve
   a. Red knob located on side of regulator
   b. Close fully clockwise, pointer on knob upward
   c. Open by turning the knob counterclockwise
   d. Rotation of the knob is limited to 1/2 turn
   e. Do not use tools to open or close—finger pressure only.

FACE PIECE

Department members have been fit tested and issued their own SCBA facepiece. SCBA facepiece should be connected to regulator of SCBA at the beginning of the watch and removed at the end of the watch. Department members are responsible for securing their SCBA facepiece when off shift. Department members will bring their issued mask when reporting for annual SCBA mask fit testing.

Department members' ID Number will be marked on the SCBA face piece/mask assembly. During triannual and monthly inspections the face piece will be inspected by the Division Chief or Battalion Chief.

DAILY INSPECTION

The following procedure shall be used for the daily inspection of the respirator. All respirators shall be inspected after each use. If any malfunction is noted, remove the respirator from service, tag it with Form 3106.1 and notify Mobile Air. No units will be accepted by Mobile Air without an attached Form 3106.1.

1. Visually inspect the complete respirator for worn or aging rubber parts, worn or frayed harness webbing or damaged components.

2. Check the latest cylinder hydrostatic test date written on the top of the cylinder to ensure it is current; i.e. within 3/5 years for composite (fiberglass/kevlar overwrapped) cylinders.
SECTION 2. SCOTT 4.5 SELF-CONTAINED BREATHING APPARATUS

3. Visually inspect cylinder for dents or gouges in metal or in fiberglass wrapping. Cylinders which show exposure to high heat or flame, such as paint turned brown or black, decals charred or missing, gauge lens missing or elastomeric bumper distorted, shall be removed from service and emptied of compressed air. Mobile Air shall be notified and will replace the damaged cylinder.

4. Check the cylinder pressure gauge for "FULL" indication. If the cylinder pressure is less than fully charged, change cylinder. Also check the hydrostatic test date.

5. Check to ensure reducer hose coupling is hand tightened to the cylinder valve outlet. **CAUTION:** Wrenches shall not be used, as damage to the coupling gasket may result.

6. Check that breathing regulator purge valve (red knob on regulator) is closed (full clockwise and pointer on knob upward). Do not use tools to open or close the purge valve. Open or close by using finger pressure only. **CAUTION:** Rotation of the purge valve is limited to 1/2 turn.

7. Fully depress the center of the donning switch on the top of the regulator and release.

8. Slowly open the tank valve fully by rotating knob counter clockwise. Vibralert alarm shall activate then stop. There should be no airflow from the facepiece. Compare tank pressure reading with the remote reading pressure gauge.

9. Don the facepiece or hold the facepiece to the face to affect a good seal.

10. Inhale sharply to automatically start the flow of air.

11. Breathe normally from the facepiece to ensure proper operation.

12. Remove facepiece from face. Air shall flow freely from the facepiece.

13. Fully depress the center of the donning switch on the top of the regulator and release. The flow of air from the facepiece shall stop.

14. Rotate purge valve 1/2 turn counterclockwise (pointer on knob downward). Air shall freely flow from the regulator.

15. Rotate purge valve 1/2 turn clockwise to full closed position (pointer on knob upward). Air flow from regulator shall stop.

16. Push in and rotate cylinder valve knob clockwise to close. When cylinder valve is fully closed, open purge valve slightly to vent residual air pressure from system. The Vibralert shall actuate as the pressure drops below 1000 psi. When airflow stops, return purge valve to the fully closed position (pointer on knob upward).

**SCBAs SHALL BE INSPECTED DAILY AND AFTER EACH USE**
HOW TO DON THE SCBA 4.5

Full Personal Protective Equipment must be properly worn for intended operational use. Improper use in a hazardous atmosphere may result in personal injury or death.

1. Check the cylinder Pressure Gauge for Full indication.
2. Open Cylinder completely (approximately three full turns).
3. Listen for Vibralert and PASS distress alarm (3 quick chirps). Both actuate then stop.
4. Check Remote Pressure Gauge for Full indication (should match the Cylinder Gauge).
5. Don the SCBA using proper overhead technique. Grasp support member frame at the sides of Back-Pak. Swing SCBA overhead making sure elbows extend through the loops formed by the shoulder straps.
6. Slide the SCBA down back leaning slightly forward. Pull to secure Shoulder Straps and then connect the Waist Buckle latch. Cinch the waist belt straps firmly on both sides so that weight is carried on the hips. Readjust Shoulder Straps if needed.
7. Controlling your Helmet. Your Helmet should be on your head with the chinstrap closed and fully extended. Bring the Face Piece with Regulator attached up to your face. While holding the Face Piece with the left hand (the Low Pressure Hose and Regulator are on the left side), use your free hand to remove your Helmet. Allow the Helmet to hang on your left arm by the chinstrap.
8. Donning the Face Piece. Make sure the Face Piece is up to your face. Place chin in the chin pocket with one hand holding onto the Regulator. Pull the Head Net over the head ensuring the straps are lying flat against the head. Tighten chin first then temple straps. Air will be supplied during inhalation.
9. Donning your protective Hood. (Make sure the Hood is carefully tucked in the turnout coat collar prior to the donning procedure). Pull the face opening over your head and secure the Hood to cover the Face Piece rim. Make sure the Hood is not obstructing any vision. No skin of the neck or face should be exposed once the Hood is secured.
10. Securing the Helmet. While holding the Face Piece, slide the Helmet back up your left arm and place it on top of your head. If your Helmet has a Shroud make sure it is down. Tighten the Helmet chinstrap.
11. **Face Piece Seal Test.** Once the Donning Switch has been activated, make sure the Face Piece has a good seal. Breathe normally to ensure proper operation. Remember, no leaks.

12. **Positive Pressure Test.** Pull Face Piece out with finger and listen for free flowing air. Secure Face Piece.

13. **Purge Valve (Bypass) Test.** Rotate the Purge Valve 1/2 turn counterclockwise (pointer knob downward) to open. Air shall flow freely from the Regulator. Rotate Purge Valve clockwise (pointer knob upward) to close.

14. **PASS (Personal Alert Safety System) Distress Alarm Test.** Activate PASS by depressing the RED alarm button on the Control Console (Remote Gauge) located on the user’s right shoulder. The PASS alarm goes into full alarm mode with a bright RED flashing light. Turn off the distress alarm activator manually by depressing the YELLOW reset button twice.

**HOW TO DOFF THE SCBA 4.5**

1. Loosen chinstrap on Helmet while holding the Face Piece, then slide Helmet down your left arm hanging it by the chinstrap.

2. Remove Hood.

3. Fully depress the center of the Donning Switch on top of the Regulator and release. Airflow will stop.

4. Doff the Face Piece (loosen the chin and temple straps), then free the Face Piece from the Helmet chinstrap.

5. Loosen and disconnect Waist Buckle Latch.


7. Completely close air Cylinder (push valve inward, and turn clockwise until fully closed).

8. Bleed residual air. Slowly open Purge Valve and listen for Vibralert deactivation.


10. Turn off the distress alarm activator manually by depressing the YELLOW reset button twice.

11. Reset all straps to the fully extended position (shoulder, waist, and head net).
RELIEF SCBA RESPIRATORS

The Department has a cache of relief SCBAs. When a SCBA is put out of service. Mobile Air One distributes a “loaner” to be used while the regular unit is serviced.

Some of these relief SCBAs have either a welded steel wire or solid aluminum back frame assembly and DO NOT have the integrated PASS device feature built into the in-service SCBA.

WARNING: Department members are reminded when using a relief SCBA, you MUST ACTIVATE the Personal Alert Safety System (PASS) prior to entering the fire building, contaminated or oxygen-deficient atmosphere. Relief SCBA respirators DO NOT have the self contained PASS built into the unit.

Proceed with use of respirator in accordance with SFFD policy. Additionally, every entry into a contaminated or unknown atmosphere should be planned to ensure that there is sufficient air supply to enter, carry out the tasks required and return to a safe breathing area. Firefighters should check the remote reading pressure gauge on the shoulder strap periodically to determine the rate of air consumption. In any event, the firefighters must be certain to allow sufficient air for egress from the contaminated area. If entry is attempted after the air has been partially consumed (cylinder is less than full) firefighters must be certain that the remaining air will be sufficient for safety.

If the Vibralert alarm actuates, leave the contaminated or unknown atmosphere with your partner immediately, and in a safe area, determine the cause of the alarm. If system malfunctions, remove SCBA unit from service, DO NOT USE. Notify immediate supervisor and/or Incident Safety Officer/IC/BC. Form 3106.2 needs to be completed and turned in with malfunctioning SCBA.

If the air supply has been depleted/low, replace the cylinder following the cylinder replacement procedure.
In areas where more than one respirator is being used, you can identify your alarm by sensing the vibrations through the facepiece.

**WARNING:** An impact to the regulator while the cylinder valve is open and the donning switch is activated may cause air flow from the regulator and deplete the air remaining in the cylinder.

**NOTE:** If the respirator is not going to be used for a period of time, close the cylinder valve and bleed the system by opening the purge valve. After bleeding the system, close the purge valve. Double click the Yellow Reset Button on the remote gauge to deactivate PASS feature. Failure to properly shut down, bleed, and to deactivate the integrated PASS will result in the SCBA unit going into alarm.

To resume use of the respirator, open the cylinder valve fully, repeat the facepiece donning procedure. If respirator use is resumed after the air has been partially consumed, you must be certain that the remaining air will be sufficient for your safety.

When respirator operations are completed and only when in a safe breathing area, remove unit from service. Replace the cylinder with a fully charged cylinder and carry out inspection, cleaning and storage procedures.

**EMERGENCY OPERATION**

The Presur-Pak respirator is automatic in function requiring only the opening of the cylinder valve to place into use and the closing of the cylinder valve at the end of use. In the event of a malfunction or a suspected malfunction, implement the appropriate emergency procedure listed below:

**WARNING:** These emergency operation procedures are for emergency use only and are meant to supplement, not replace, the emergency procedures prescribed by SFFD procedures. If emergency procedures are required, leave the contaminated area with your partner at once. Use of these procedures will increase the rate of consumption of the air supply and may cause the intensity of the Vibralert alarm to stop completely.

1. Should the Vibralert alarm actuate during use and before the air supply is depleted to full capacity, the primary reducer may have failed and the system automatically transferred to the back up system. **LEAVE THE CONTAMINATED AREA WITH YOUR PARTNER AT ONCE ON ACTUATION OF VIBRALERT.**

2. Should the air supply be partially or completely cut off during use, or if you are unable to start the flow of air automatically, fully open purge valve (red knob on regulator) by turning it counterclockwise, pointer on knob
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CAUTION: The airflow through the respirator when the purge valve is in use can exceed 200 liters per minute. To reduce air consumption, the existing airflow may be reduced by partially closing the purge valve. Tests have shown that a full 30 minute Scott cylinder can be completely depleted in approximately 4 1/2 minutes with the face piece (mask) in place and the purge valve open.

3. Should the air supply begin to flow freely into the face piece, fully open purge valve (red knob on regulator) by turning it clockwise (pointer on knob downward), partially close the cylinder valve by pushing in and rotating clockwise to regulate the flow of air to satisfy the requirements of the user. DO NOT close the cylinder valve completely. LEAVE THE CONTAMINATED AREA WITH YOUR PARTNER AT ONCE AFTER PARTIALLY CLOSING VALVE. Emergency procedure #3 is the ONLY time the respirator may be operated with the cylinder valve less than fully opened.

4. In the unlikely event of the blockage of air flow or sudden and complete loss of the system air supply such that there is total irreversible loss of respiratory protection, LEAVE THE CONTAMINATED AREA WITH YOUR PARTNER AT ONCE USING ALL PRECAUTIONS AND FOLLOW EMERGENCY PROCEDURES PRESCRIBED BY DEPARTMENT PROCEDURES.

If the above procedures are implemented during use, REMOVE THE RESPIRATOR (SCBA) WHEN IN A SAFE AREA. Complete Form 3106.2 and attach to the SCBA (GO-03-A-42) and hold for Mobile Air.

**CYLINDER REPLACEMENT PROCEDURES**

1. Leave the contaminated area and be certain that respiratory protection is not required.
2. Doff the face piece.
3. Push in and rotate the cylinder valve knob clockwise to close cylinder valve.
4. Bleed down residual air pressure by opening the purge valve slightly. When flow of air from the face piece stops, close purge valve fully, remove the respirator or have an assistant perform the following steps.
5. Unthread the pressure reducer hose coupling from the cylinder valve by rotating counterclockwise. Then unsnap the cylinder band toggle lock.
strap and release the toggle lever by pulling upward on, and then release the lock strap.

6. Grasp the cylinder below the band, push the locking tab below the valve, lift the cylinder free from the bottom hook and remove.

7. Replace with a fully charged cylinder and valve assembly. Slide the top of the cylinder upward under the band. Engage the cylinder hanger in the hook at the bottom of the back frame.

8. While holding the lock strap, push the toggle lever to secure cylinder, then lock the toggle lever in position by attaching the cylinder band toggle lock strap to the snap on the toggle lever.

NOTE: Do not force the toggle lever. Adjust the band for a snug fit by sliding the band assembly on the angled side rails. When changing between 30 minute and either 45 minute or 60 minute cylinders, the cylinder band must also be adjusted at the bale as well as the angled side rail.

9. Align and tighten the hose coupling to the cylinder valve (hand tight only).

10. The respirator is ready for reuse.

DO NOT LEAVE THE CYLINDER VALVE OPEN WHEN NOT IN USE.

11. The removed cylinder shall be refilled and inspected by authorized personnel.

STANDBY, INSPECTION, CLEANING AND STORAGE

1. Clean the respirator after each use as follows:
   a. Inspect the equipment for worn or aging rubber parts, worn or frayed harness webbing or damaged components.
   b. Remove breathing regulator from face piece.
   c. Carefully wash the face piece assembly with warm (110 degrees F. maximum) mild soap solution and thoroughly rinse with clean water. Allow to completely dry.
   d. Damp sponge dirt accumulations from the rest of the apparatus.

2. Disinfect the face piece by one of the following methods:
   a. Sponge it with a 70% solution of ethyl, methyl, or isopropyl alcohol, or
   b. Submerge it in a hypochlorite solution made with two tablespoons of chlorine bleach in gallon of water,
   c. Rinse in cool water and allow to completely dry.

3. Connect the breathing regulator to the face piece quarter turn coupling and rotate it until it latches in place. Place on apparatus.
4. If damage or deterioration is noted, remove from service, tag (Form 3106.1) and notify Mobile Air.

**Cleaning and Disinfecting the SAP Regulator:**

1. The regulator must be connected to the respirator
2. The cylinder must be open
3. The cylinder must be at least 1/4 full
4. The swivel joint must NOT be submerged into the cleaning solution
5. Remove the face piece from the regulator
6. Remove soil from external surfaces using a mild liquid dish soap with warm water and a soft cloth
7. Inspect the inside of regulator assembly through the sensing port
8. Rinse the exterior of the regulator assembly with a soft cloth dampened with clean water
9. Mix the disinfecting solution using a ratio of four tablespoons bleach to one gallon of room-temperature water (the solution loses strength if left standing)
10. Pour the solution into a four sided plastic pan
11. Check to make sure the purge valve is closed
12. Fully depress the donning switch
13. Slowly open the cylinder valve at least one full turn
14. Hold the regulator by the swivel joint
15. Submerge the regulator into the disinfecting solution
16. **DO NOT SUBMERGE PAST THE COVER RETAINING RING, do not allow the swivel joint to be exposed to the liquid**
17. Agitate the regulator back and forth briskly
18. This insures the inside of regulator is in contact with the solution
19. The brisk agitation forces the solution throughout the exhalation valve
20. Hang or suspend the regulator over the side of the pan for a minimum of ten minutes
21. **DO NOT ALLOW THE SWIVEL JOINT TO BE SUBMERGED**
22. After ten minutes drain and shake the solution out of the regulator
23. Submerge and agitate the regulator in lukewarm rinse water
24. **DO NOT ALLOW THE SWIVEL JOINT TO BE SUBMERGED**
25. Drain and shake the regulator of the rinse water
26. Open the purge valve fully to cause a free flow through the regulator for at least five seconds.
27. Dry the exterior surfaces with a soft, clean, dry cloth or towel.
28. Secure a fully charged cylinder to the back frame
29. Replace the face piece.
APPENDIX A: SAP TECHNICAL INFORMATION—GLOSSARY OF TERMS

SECTION 3.

ANSI—American National Standards Institute

Controlled Breathing—The ability to maintain a breathing rate that is near normal for the activities being performed while wearing an SCBA.

Exhalation Valve—A device that allows exhaled air to leave a facepiece and prevents outside air from entering through the valve.

Facepiece—The component of the respirator that covers the wearer's nose, mouth, and eyes. It is designed to make a particle tight fit with the face and includes the headbands, exhalation valves, and other necessary components required to connect it to a respirable gas source.

Hazardous Atmosphere—Any atmosphere that is oxygen deficient or that contains a toxic or disease-producing contaminant.

MSHA—Mine Safety and Health Administration of the US. Department of Labor.

NIOSH—National Institute for Occupational Safety and Health of the US. Department of Health and Human Services.

Open Circuit SCBA—An SCBA in which exhalation is vented to the atmosphere and not re breathed.

OSHA—Occupational Safety and Health Administration, US. Department of Labor.

Oxygen Deficient Atmosphere—Oxygen concentrations less then 19.5 percent.

Point of No Return—The point at which the remaining operation time of breathing apparatus equals the time necessary to return safely to a non-hazardous atmosphere.

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

Sanitation—The removal of dirt and the inhibiting of the action of agents that cause infection or disease.
Self Contained Breathing Apparatus (SCBA)—A respirator worn by the user that supplies a respirable atmosphere that is either carried in or generated by the apparatus, and that is independent of the ambient environment.
APPENDIX B: MONTHLY AIR/OXYGEN CYLINDER HYDROSTATIC TEST REPORT

Each Division, Battalion, Company Commander and Bureau Head, if applicable, shall submit a monthly report to Mobile Air. This report shall indicate whether all cylinders were inspected, were in compliance, and if not in compliance, reported to Mobile Air.

The date on which the next hydrostatic test is required will be WRITTEN in either black or red marking pen on the top of the cylinder, just below the neck (i.e. 2/88). Report all cylinders that have reached their next required test date during the past month and all cylinders that will be reaching the required test date in the next reporting period.

Mobile Air will pick up all cylinders that need testing. Replacement cylinders will be provided.

In addition, Acetylene cylinders shall also be inspected for compliance.

Safety Practices

In conjunction with the above practices, the following regulations shall be observed when filling ANY cylinder: SCOTT, SCUBA, or Oxygen.

It is mandatory that each cylinder be checked for the HYDROSTATIC TEST DUE DATE WRITTEN in either black or red marking pen at the top of each cylinder BEFORE filling. If the test date has passed, DO NOT fill the cylinder. Notify Mobile Air for cylinder pick-up.

Fragmentation Safety Tanks provided in stations with permanent fill stations MUST be used when filling cylinders.
APPENDIX C: MOBILE AIR PROCEDURES

All cylinders and complete breathing units are to be checked by members performing “Daily Morning Apparatus Checks”.

Call for deliveries from Mobile Air (x3545) are to be made between 0800 to 1000 hours. NO equipment will be picked up for repair unless SCBA Repair Request Tag accompanies the item (Form #3106.1). If Mobile Air is Out of Quarters, a message can be left on voice mail.

Any company who fails to obtain refills at the greater alarm will be required to respond to the nearest station with refilling capabilities and refill their breathing apparatus bottles.

These stations are:
- Station 1
- Station 15
- Station 38
- Station 25 Portable SCBA Compressor Trailer
- Division of Training, Folsom Street
- Division of Training, Treasure Island

Note: Firefighter assigned to Mobile Air will remain at their apparatus during emergencies. Companies shall come to Mobile Air for refills.

Prior to leaving Treasure Island Training Facility, Treasure Island shall refill SCBA cylinders of companies who use their SCBAs while attending training modules at the Division Training

**Oxygen:**
Companies are responsible for obtaining refills of their oxygen cylinders.

The following stations have been equipped with oxygen cascade systems for refilling of oxygen cylinders:
- Station 1
- Station 7
- Station 9
- Station 13
- Station 14
- Station 15
- Station 22
- Station 38
Use of the air compressor, as well as use of ALL air or oxygen cascade supply systems is limited to trained and authorized department personnel ONLY.
APPENDIX D: SCBA REPAIR REQUEST AND FORM 3106.1

Members performing “Daily Morning Apparatus/Equipment Checks” who discover a malfunctioning SCBA must perform the following:

- Immediately remove the SCBA from the apparatus;
- Label the SCBA with SCBA Repair Request Tag (form 3106.1, Green/Yellow in color, see below); and
- Immediately notify (through company officer) Mobile Air of the problem so that a loaner may be exchanged with the malfunctioning SCBA.

![SCBA Repair Request Form](image)
APPENDIX E: SCBA MALFUNCTION AT INCIDENT AND FORM 3106.2

1. Members who discover a malfunctioning SCBA while on-scene at an incident must perform the following:
   a. Notify one’s officer of the suspected malfunction whenever it is reasonably possible;
   b. Immediately remove oneself and your partner from the “Immediately Dangerous to Life or Health” (ILDH) environment; and
   c. Doff the malfunctioning SCBA and place it inside the cab of one’s apparatus (Please note that NO member is permitted to touch the malfunctioning SCBA once this is exercised).

2. Once a member performs the above procedures while on-scene at an incident, his/her company officer must immediately notify the Incident Safety Officer. In the event the Incident Safety Officer is unavailable, the Incident Commander will assign a Battalion Chief the responsibility of securing malfunctioning SCBA prior to the departing of the unit to which the SCBA is assigned.

3. The Battalion Chief assigned this task must place the malfunctioning SCBA into a biohazard bag and label it with the SCBA Malfunction Form (Form 3106.2, Orange in color), with the description of the problem documented on this form. The Battalion Chief must then return the malfunctioning SCBA to his/her quarters.

SCBA Incident Malfunction Tag

User ID #:  ____________________________  Co #:  ____________________________

Date of Incident:  ____________________________  Incident #:  ____________________________

Description of reported problem:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

Form 3106.2  ____________________________  Name & ID of member filling out tag
4. The Battalion Chief must then notify the Department Safety Officer of having performed the above procedures. The Department Safety Officer will then arrange to pick up the malfunctioning SCBA within 24 hours of notification.

5. The company officer in charge of the malfunctioning SCBA must notify Mobile Air either at the scene or upon his/her return to quarters that a malfunctioning SCBA was discovered and a loaner is warranted.

6. The Department Safety Officer will ensure that the malfunctioning SCBA is inspected by the Department’s certified technician or by an appropriate outside agency. Once the malfunctioning SCBA is inspected, it will be serviced (if warranted) and returned to the company to which it is assigned.
APPENDIX F: PORTABLE SCOTT COMPRESSOR TRAILER

The Fire Department has a portable Scott compressor on a trailer located at station 25.

This unit is capable of filling SCBA & SCUBA bottles. The system has a revolving fill station which allows for two (2) bottles to be filled at a time, while two (2) other bottles are being set up to be filled. The unit also has a high pressure hose reel located on the front with 250 feet of hose that can be used to fill bottles remote from the unit. (BART/MUNI, High rise)

The 20 hp motor which runs on diesel fuel powers the compressor and the generator. The unit has a tower light with four 500watt lights along with several outlets for supplying power.

This unit requires members to be passed up on the unit before they can operate it. The members at Station 25 will respond and operate unit when requested.
APPENDIX G: DRÄGER BG-4 CLOSED-CIRCUIT BREATHING APPARATUS

The Fire Department has purchased and has available for use at prolonged/long distance incidents the Drager BG4 re-breathers.

BG-4 Closed-Circuit Breathing Apparatus (CCBA): Extended Operation - Up to 4 Hours!

The Dräger BG-4 is a NIOSH & MSHA Approved Closed Circuit Breathing Apparatus providing superior respiratory protection in IDLH environments for up to 4 hours! Conventional SCBA’s are limited to just one hour or less and do not provide the extended time that is required in critical operations like: search and rescue, hazardous materials clean-up, domestic preparedness, or mine and tunnel rescue. The low profile of the BG-4 makes it easy to use under protective clothing. Every BG-4 is equipped with the Moniton®, a fully electronic alarm, test and pressure display system that provides continuous information to the user.

The re-breathers will only be used by trained personnel.

All maintenance on these units will be conducted by trained members from E36, RS1, RS2 and MA1.

The units are carried on Haz Mat 1 and Mobile Air 1.