

Respiratory Protection Program

COMPLIANCE DOCUMENT FOR 29 CFR 1910.134, NFPA 1404 & NFPA 1852
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SECTION 1: INTRODUCTION 1910.134 (a)(c)

The following document of the Bristol Fire Department establishes requirements for the selection, care, and maintenance of self-contained breathing apparatus (SCBA) as required by the respiratory protection program in OSHA 1910.134 and NFPA 1500: Fire Department Occupational Safety and Health Program to reduce health and safety risks associated with improper maintenance, contamination, or damage. In addition, this plan also incorporates NFPA 1404 in accordance with the training component of the Respiratory Protection Program.

Firefighters respond to a variety of emergencies. Fires involving structures, vehicles, and chemicals, as well as rescues involving confined spaces or hazardous atmospheres present respiratory hazards. When human life is threatened, firefighters generally do not have extended periods of time in which engineering controls can be placed to eliminate or reduce hazards. Following the same practices as general industry, such as evaluating each worksite and its individual hazards, is not practical. In fact, it is probably the lack of such work practices by the victim or their co-worker that has contributed to the emergency the firefighter has responded to. (a)(1)

The Fire Department is required by OSHA to provide to each firefighter all equipment, training, and other related services required under this plan, at no cost to the firefighter. All expenses related to this program are being paid by the Fire Department. (a)(2)

This program will detail the general requirements as well as the detailed requirements and specific actions taken for compliance in the areas of respirator selection, medical evaluation, fit testing, procedures for proper use in routine and reasonably foreseeable emergencies, procedures for respirator cleaning, disinfecting, storing, inspecting, repairing, and maintenance, procedures for air quality assurance, training in hazards, use, wear, and maintenance, and program evaluation. (c)(1)

The Fire Department will maintain and update periodically this written respirator protection program that contains specific procedures for respirator use. (c)(1)

While not required or prohibited, nothing in this program prohibits firefighters from utilizing dust type masks when respiratory protection is not required by this document.

Nothing in this program shall prohibit an employee from using a HEPA respirator when not required during simple chores, routine station, or equipment maintenance tasks, or on the scene of non-structural fire suppression or non-confined space rescue where dust may be a nuisance. When doing so, the employee is reminded to be aware of the material and commentary contained in Appendix D of 29 CFR 1910.134. (c)(2)

The Respiratory Protection Program (RPP) administrator is the Fire Chief. (c)(3)

The RPP administrator is responsible for implementation, coordination, evaluation, and revision of the program, including developing compliance programs for all OSHA requirements. The initial and annual training of employees (firefighters) will be achieved through the RPP administrator or their designee.

Medical evaluation for the Fire Department is implemented, coordinated, evaluated, and revised by RPP administrator.

Supervisors (Deputy Chief, Assistant Chief, Captain(s), and Lieutenant(s)) are responsible for ensuring the program is carried out and that all fire department personnel comply. Other specific responsibilities (such as incident scene operations, feedback to RPP administrator and maintenance procedures) are enumerated throughout the program. To this end, supervisors need to ensure problems or potential problems are communicated to the RPP administrator.

All Bristol Fire Department employees assigned to the Firefighter function, are responsible for following and implementing this program and using the several pages as a reference source during routine and non-emergency activities such as training and maintenance. To this end, personnel need to care for their issued facepiece.

When a firefighter has a question regarding the respirator protection program, respirator (SCBA) maintenance or use they should contact the RPP administrator or their designee.

As mentioned above, the Fire Department is required by OSHA to provide to each firefighter all equipment, training, and other related services required under this plan, at no cost to the firefighter. All expenses related to this program are the responsibility of the Fire Department. (c)(4)

All printed materials (e.g., owner's manuals, instructions, etc.) and instructional videos produced by SCOTT, for the Air-Pak X3 Pro SCBA are hereby incorporated by reference into this program.

SECTION 2: DEFINITIONS 1910.134 (b)

○ Atmosphere-supplying respirator	Means a respirator that supplies the respirator user with breathing air from a source independent of the ambient atmosphere and includes SARs and SCBA.
○ 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.
○ End of Service Time Indicator (EOSTI)	Means a bell, whistle or other device which is an integral part of the SCBA intended to notify the user and all other persons in the immediate work area of the user that the SCBA has approximately 1600 PSI or less of breathable air in its cylinder.
○ Fit Test	Means the use of a protocol to evaluate the fit of a respirator qualitatively or quantitatively on an individual.
○ High Efficiency Particulate Air (HEPA) filter	Means a NIOSH N100, R100 or P100 filter. N95 TB masks are not the same as HEPA filter masks.
○ Immediately Dangerous to Life or Health (IDLH)	Means an atmosphere that poses an immediate threat to life, would cause irreversible health effects, or would impair an individual's ability to escape from a dangerous atmosphere unaided.
○ Incipient stage fire:	Means a fire which is in the initial or beginning stage and which can be controlled or extinguished by portable fire extinguishers, Class II standpipe (house line) or small hose systems (less than 1.5 inch in diameter) without the need for protective clothing or breathing apparatus.
○ Interior structural firefighting	Means the physical activity of fire suppression, rescue, or both, inside of building and enclosed structures which are involved in a fire situation beyond the incipient stage.
○ Loose fitting facepiece	Means a respiratory inlet covering that is designed to form a partial seal with the face.
○ Low air alarm	See End of Service Time Indicator
○ Member	A person involved in performing the duties and responsibilities of a fire department, under the auspices of the organization.
○ OSHA	The Occupational Safety and Health Administration of the U.S. Department of Labor.
○ Oxygen deficient atmosphere	Means an atmosphere with an oxygen content below 19.5 percent by volume.
○ Physician or other licensed health care provider (PLHCP)	Means an individual whose legally permitted scope of practice (i.e.: license, registration, or certification) allows him or her to independently provide, or be delegated the responsibility to provide, some or all the health care services required by OSHA under this respiratory protection program.
○ Point-of-No-Return	Means the distance traveled on air in an IDLH atmosphere where 50 percent of the service pressure has been used and the remaining 50 percent allows for egress from the IDLH atmosphere.
○ Positive pressure respirator	Means a respirator in which the pressure inside the respiratory inlet covering exceeds the ambient air pressure outside the respirator.
○ Pressure demand respirator	Means a positive pressure atmosphere-supplying respirator that admits breathing air to the facepiece when the positive pressure is reduced inside the facepiece by inhalation.
○ Qualified Person	A person who, by possession of a recognized degree, certificate, professional standing, or skill, and who, by knowledge, training, and experience, has demonstrated the ability to deal with problems relating to a particular subject matter, work, or project.
○ Qualitative fit test (QLFT)	Means a pass/fail fit test to assess the adequacy of respirator fit that relies on the individual's response to the test agent.

○ Quantitative fit test (QNFT)	Means an assessment of the adequacy of respirator fit by numerically measuring the amount of leakage into the respirator.
○ Respiratory inlet covering	Means that portion of the respirator that forms the protective barrier between the user's respiratory tract and an air-purifying device or breathing air source, or both. It may be a facepiece, helmet, hood, suit, or a mouthpiece respirator with nose clamp.
○ 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. All respirators (SCBA) are NIOSH-approved and meet NFPA 1981 & ANSI requirements.
○ Shall	Indicates a mandatory requirement.
○ Should	Indicates a recommendation or that which is advised but not required.
○ Supplied air respirator (SAR)	Means an atmosphere-supplying respirator for which the source of the breathing air is not designed to be carried by the user.
○ Tight-fitting facepiece	Means a respiratory inlet covering that forms a complete seal with the face.
○ User seal check	Means an action conducted by the respirator user to determine if the respirator is properly seated to the face.

SECTION 3: RESPIRATOR SELECTION *1910.134 (d)*

Each incident scene is different and unique. All incidents pose a hazard. If there were not a hazard the firefighter would not have been summoned in the first place. Since time will not allow for a detailed analysis of each hazard these atmospheres must be assumed to be immediately dangerous to life or health. Interior Structural Fire Fighting is deemed IDLH (immediately dangerous to life or health) by OSHA and therefore certain procedures and equipment become automatically required for the firefighter. (d)(1)

Hazards the firefighter may face include, but are not limited to:

- Smoke
- Carbon monoxide
- Oxygen deficiency
- Super-heated gases
- Chemical fumes and/or vapors
- Particles and/or dust from chemicals

The Fire Department supplies only open-circuit, positive-pressure SCBA (Air-Pak X3 Pro) manufactured by SCOTT Fire & Safety. Facepieces for SCBA are available to firefighters in all sizes manufactured by SCOTT. All SCBA and facepieces are NIOSH-approved. (d)(2)

While Confined Space Rescue and Hazardous Materials incidents may not be IDLH, the use of a respirator may be required by the site-specific incident commander, based on known, unknown or suspected hazards. In these cases, SCBA will be worn as it is readily available since it offers the highest level of protection and the employee (firefighter) is most familiar with its operation. (d)(3)

SECTION 4: MEDICAL EVALUATION *1910.134 (e)*

Prior to fit testing, training involving the wearing of a respirator or required use, an employee (recruit firefighter) must undergo a medical evaluation. (e)(1)

A Physician or other Licensed Health Care Professional (PLHCP) shall perform all medical evaluations and subsequent testing or examinations. The PLHCP shall use the questionnaire referenced in this program (*Appendix-A*). The questionnaire shall contain all elements in [Appendix C, Part A, Sections 1 & 2](#) of the OSHA Respirator Medical Evaluation Questionnaire (Mandatory). (e)(2)

The results on the initial medical evaluation will determine if any further examination or testing is required before medical clearance is granted. Positive answers to any of questions 1 through 8 of Appendix C, Part A, Section 2 shall require further examination. If the initial exam demonstrates to the PLHCP a need for further examination or testing such shall occur. Whatever tests, consultations or procedures are deemed necessary by the PLHCP to make a final determination. (e)(3)

The medical questionnaire contained in this program, or a similar version containing all the required elements under Appendix C, Part A, Sections 1 & 2 of the OSHA Respirator Medical Evaluation Questionnaire, shall be completed by each recruit firefighter prior to meeting with the PLHCP. The questionnaire may be completed at a time and place convenient to the employee recruit firefighter or at the location of the PLHCP immediately prior to the evaluation meeting. In any case, the questionnaire shall be retained by the recruit firefighter to ensure confidentiality and submitted to the PLHCP at the evaluation session. (4)(i)

Upon completion of the medical evaluation session, review of the questionnaire by the PLHCP, any follow-up exam, tests, consultations and procedures, and a final determination the PLHCP, the recruit firefighter shall have the opportunity to discuss the same with the PLHCP. This may be done at the closure of the session, provided a final determination has been made, or by making an appointment with the PLHCP to discuss the above items. In any case, the fire department will only provide at the fire department's expense a single opportunity for the recruit firefighter to discuss the results. Nothing in this program shall prohibit the recruit firefighter from contacting the PLHCP on his or her own time and at his or her own expense and discussing the evaluation and final determination. (4)(ii)

Additional medical evaluations shall only be provided if:

1. An employee (firefighter) reports medical signs or symptoms that are related to the ability to use a respirator. *A report by a firefighter may be explicit or implicit. An explicit report is one in which the firefighter makes written notification of his or her signs or symptoms to the Respirator Program Administrator. An implicit report is one in which comments or behaviors of the firefighter are observed, overheard, or obtained. If the employee (firefighter) desires medical reevaluation he or she must make written notification otherwise the fire department may not understand the report.*
2. A PLHCP, supervisor (any officer), or the Respirator Program Administrator informs the fire department that a firefighter needs to be reevaluated.
3. Information from the Respiratory Protection Program, including observations made during fit testing and program evaluation, indicates a need for firefighter reevaluation.
4. A change occurs in the workplace conditions (e.g., physical work effort, protective clothing, temperature) that may result in a substantial increase in the physiological burden placed on a firefighter. *Since fire suppression and rescue work is already performed in full protective clothing, under unknown temperature conditions and may involve maximal physical effort, it is not likely that this condition would warrant or dictate any additional medical evaluation.* (e)(7)

See **Appendix - A** for the *OSHA Respirator Medical Evaluation Questionnaire*

SECTION 5: FIT TESTING 1910.134 (f)

Once medical evaluation has been completed, but prior to any training in or the actual use of respiratory protection, each employee shall have a facepiece fit test.

Fit testing shall also occur:

- On an annual basis. (f)(2)
- Whenever there is a change in facepiece size, style, model or make. (f)(2)
- Whenever an employee, supervisor, the employer, the respiratory protection program administrator or the PLCHP visually observes a physical change in the employee that could affect facepiece fit. Such changes include, but are not limited to, facial scarring, dental changes, cosmetic surgery, or an obvious change in body weight. (f)(3)
- Whenever an employee has passed a fit test but finds the fit unacceptable. (f)(4)
When this occurs retesting shall occur until an acceptable fit test is obtained by the employee.

All fit testing shall be performed following the General Requirements contained in the standard's [Appendix A, Part 1. A.](#)

The Bristol Fire Department may use the quantitative fit testing (QNFT) method. (1) The specific QNFT used shall be the OHD Quanifit apparatus (Appendix A, Part I, A & C 1 & 3). The fit testing results shall be supplied to the respirator protection program administrator in a computer-generated format and signed by the employee tested and the test administrator.

General requirements:

1. The test subject being tested shall be able to pick the size face piece (from those available for the SCBA used by the department) which provides the most acceptable fit for the user.
2. Prior to the selection process the test subject shall be shown how to put on the facepiece, how it should be positioned, how to set strap tension and how to determine acceptable fit. A mirror shall be available to assist the test subject in evaluation fit and positioning of the facepiece. This instruction cannot constitute the subject's formal training because it is only a review.
3. The test subject shall be informed that he/she is being asked to select a facepiece that provides the most acceptable fit.
4. Assessment of comfort shall include a review with the test subject and allowing the test subject an adequate time to determine the comfort of the facepiece position on the face and cheeks.
5. The following criteria shall be used to help determine the adequacy of the respirator fit:
 - (a) Chin properly placed
 - (b) Adequate strap tension, not overly tightened
 - (c) Tendency of facepiece to slip
 - (d) Self-observation in mirror to evaluate facepiece fit and position
6. The test subject shall conduct a user seal check, either the negative or positive pressure seal checks described in the OSHA regulation or those recommended by the respirator manufacturer which provide equivalent protection.
Before conducting the user seal-check the subject shall be told to seat the facepiece by slowly moving their head from side to side and up and down while taking a few slow deep breaths. If the user seal check fails another facepiece shall be selected and tested until a successful user seal check is obtained.
7. 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.
8. If a test subject exhibits difficulty in breathing during the tests, he/she shall be referred to the PLHCP to determine whether the test subject can wear a respirator while performing their duties.
9. Prior to the commencement of the fit test, the test subject shall be given a description of the fit test, the test subject's responsibilities during the test procedure and a description of the test exercises.
10. The facepiece shall be worn for at least five minutes before the start of the fit test.

See **Appendix - D** for the [Respirator Fit Test Record](#)

SECTION 6: USE OF RESPIRATORS **1910.134 (g)**

OSHA requires the Fire Department to survey and evaluate the workplace for stress and other conditions that may affect Self-Contained Breathing Apparatus (SCBA) effectiveness. Since the workplace where SCBA use will occur is either an actual emergency (fire suppression or rescue) or a training evolution designed to simulate an actual emergency, the stress and other conditions that may affect SCBA effectiveness are extreme and mandate the use of SCBA in all situations.

This program applies equally to both training sessions as well as actual incidents. Under no circumstance will safety of firefighters be sacrificed to speed up operations.

1. Firefighters will use a SCBA under conditions specified by this program, and in accordance with the training they receive on the SCBA. In addition, the SCBA shall not be used in a manner for which it is not certified by NIOSH or by the manufacturer.
2. Firefighters shall conduct a facepiece seal check each time they don the SCBA. **Firefighters are not permitted to don their tight fitting SCBA facepiece if they have facial hair that comes between the sealing surface of the facepiece and the face or that interferes with valve function, or any other condition that interferes with the face-to-facepiece seal or valve function.**
3. If a firefighter wears corrective glasses or goggles or other personal protective equipment, the Fire Department shall ensure that such equipment is worn in a manner that does not interfere with the seal of the facepiece to the face of the user.
4. Upon each donning of the facepiece, firefighters must perform *User Seal Check Procedures (Mandatory)* as outlined in OSHA [1910.134 Appendix B-1](#) or as prescribed by the respirator manufacturer's (Scott) recommended user seal check method.
5. Firefighters in the hazard area will continue to wear their SCBA until the team leader, with IC's approval, authorizes a lesser level of personal protection.
6. Firefighters must leave the SCBA use area if they detect vapor or gas breakthrough, changes in breathing resistance, or leakage of the facepiece.
7. SCBA are to be worn during overhaul activities. Carbon Monoxide and Hydrogen Cyanide levels are still considered dangerous when above their permissible exposure limit (PEL). Other chemical compounds and carcinogens may be present especially when materials are smoldering. To this end the multi-gas meter needs to be used to determine that any Carbon Monoxide or Hydrogen Cyanide present in the air does not exceed the NIOSH PELs of 35 PPM for CO and 4.7 PPM for HCN.

Note: No firefighter should consume more than two (2) full cylinders of compressed breathing air without an adequate rest period and rehabilitation.

8. Firefighters leaving the SCBA use area must wash their face and facepiece to prevent skin or eye irritation. At the scene of an incident or during training this may not be possible. However, prior to food or beverage consumption hand and face washing needs to occur. The Bristol Fire Department provides [FIREWIPES](#) to its firefighters as on-scene method to decon. Wipes are made to remove soot, smoke, and other harmful carcinogens that employees may be exposed to in hazardous environments. Upon return to the fire station firefighters should wash their hands and face (even if they did so at the scene) shower and change clothes. Firefighters will care for their facepiece and SCBA.
9. **Procedures for IDLH (Immediately Dangerous to Life and Health) Atmospheres (2-In/2-Out):**
The following are not meant to preclude an Incident Commander from starting suppression (not entering) or rescue operations (entering) in a structural incident. The requirement intends that the Rapid Intervention Team (RIT) be established as soon as practical to ensure safety of firefighters, yet not detract from the responsibility to provide rescue and suppression to citizens.

Rapid Intervention Team (RIT) as described in NFPA 1500 (8.8):

- a. The fire department shall provide personnel for the rescue of members operating at emergency incidents.

- b. In the initial stages of an incident where only one team is operating in the hazardous area at a working structural fire, a minimum of four individuals shall be required, consisting of two firefighters working as a team in the hazardous area and two standby firefighters present outside this hazardous area available for assistance or rescue at emergency operations where entry into the danger area is required.
- The standby firefighters shall be responsible for maintaining a constant awareness of the number and identity of firefighters operating in the hazardous area, their location and function, and time of entry.
 - The standby firefighters shall remain in radio, visual, voice, or signal line communication with the team.
 - One standby firefighter shall be permitted to perform other duties outside of the hazardous area, such as apparatus operator or incident commander, provided constant communication is maintained between the standby firefighter and the firefighters of the team.
 - The assignment of any personnel, including the incident commander, the safety officer, or operators of fire apparatus, shall not be permitted as standby personnel if by abandoning their critical task(s) to assist or, if necessary, perform rescue, they clearly jeopardize the safety and health of any firefighter working the incident.
 - When only a single team is operating in the hazardous area in the initial stages of the incident, this standby firefighter shall be permitted to assist with, or if necessary, perform, rescue for firefighters of his or her team, provided that abandoning his or her task does not jeopardize the safety or health of the team.
 - Once a second team is assigned or operating in the hazardous area, the incident shall no longer be considered in the “initial stage,” and at least one RIT shall be deployed that complies with the four personnel requirements.
- c. A RIT shall consist of at least two firefighters and shall be available for immediate rescue of a firefighter or a team. Each RIT shall be fully equipped with the appropriate protective clothing, protective equipment, SCBA, and any specialized rescue equipment that might be needed given the specifics of the operation under way.
- d. The composition and structure of a RIT shall be permitted to be flexible based on the type of incident and the size and complexity of operations.
- e. The incident commander shall evaluate the situation and the risks to operating teams and shall provide one or more RITs commensurate with the needs of the situation.

In the early stages of an incident, which includes the deployment of a fire department's initial attack assignment, the RIT shall follow NFPA 1500 8.2.5.1 and 8.8.2.5 and be either one of the following:

- a. On scene firefighters designated and dedicated as a RIT
- b. On scene firefighters performing other functions but ready to redeploy to perform RIT functions.

10. Nothing in this rule is meant to preclude firefighters from performing emergency rescue activities before an entire team has assembled, however, such action is not to be considered a standard of operation. Whenever the Two In, Two Out rule is not followed, a written report must be submitted to the fire chief, by the individual(s) who were involved in the incident explaining the necessity of doing so.

Air Management

To establish department policy consistent with NFPA 1404 (Standard for Fire Service Respiratory Protection Training) and OSHA 29 CFR 1910.134 with regards to SCBA air management practices when operating in an IDLH atmosphere.

NFPA 1404 recommends that firefighters exit the IDLH atmosphere before their low-air alarm activates. Federal guidelines set this low-air alarm figure at 33% of the cylinder volume. This air is to be considered your emergency reserve if something goes wrong. It is no longer accepted practice to work until the low air alarm activates and then hope you can exit the IDLH atmosphere before running out of air. The Current NFPA 1404 makes specific reference to air management in an IDLH environment, the self-contained breathing apparatus use in training, and the frequency and level of training to be maintained.

“Air Management” needs to be an integral part of our emergency operations while working in an IDLH environment. Air management is a practice, a philosophy, and a mind-set to make all firefighters aware as a team of their air supply.

Air Management Philosophy:

1. Don't breathe smoke
2. Your air is your responsibility
3. An alarm-free fire ground

Rules of Air Management:

1. Exit BEFORE you use your reserve air
2. A low alarm indicates use of reserve
3. Alarm activation is an 'immediate action item'

To comply with NFPA 1404, it is the responsibility of all firefighters to monitor their air supply and know how much air they have and when they need to begin exiting the IDLH atmosphere. The goal is to begin your exit with enough air that you can make it out without the low-air alarm activating. This is known as the 'Rule of Air Management' (ROAM). Following this rule will help make you safer by maintaining the last 33% of your air as an emergency supply in case something were to go wrong. **Working into your low-air alarm period is betting your life that everything will go right on your way out.**

Factors that influence when to begin your exit will vary. Workload, physical conditioning, rate of breathing, stress level, fire conditions, size of the structure, visibility, and how far you have worked your way into the hazardous area all factor in. As an example, the time required to exit a 900 square foot residence should be less than the time required to exit a commercial structure and therefore adjusted accordingly.

Teams shall base their decisions off the lowest volume reading of the team as to when to exit. This may require firefighters to rotate positions of heavy work vs. lighter work so that air consumption is more equalized.

On the fire ground every firefighter is responsible for managing their personal air supply and frequently communicating the status of their air supply to the team leader. In turn, the team leader will give frequent progress reports including air status to command.

Prior to entry into the hazard zone, the team leader will brief their team on the plan for achieving the tactical objectives including exiting the hazard zone together. This ensures the team has a “round trip ticket” into and out of the hazard zone safely.

Activation of the low-air warning is an 'immediate action' item for the individual and the team involved. Immediate action is described as notifying command of low-air alarm activation and immediately exiting the IDLH atmosphere intact as a team and notifying command that you are out with a PAR after exiting. If a team member is unable to exit due to being lost, trapped, or injured and immediate Mayday shall be called. Furthermore, when remaining air supply in the SCBA cylinder reaches the 15%-18% range a Mayday should be called if personnel are still inside an IDLH atmosphere and will be unable to exit in 5 minutes.

In a situation that is not an urgent Mayday situation such as a low air activation while still inside an IDLH atmosphere but near an exit and able to reach the exterior safely, the notification from the team to command shall include the following information:

- Firefighter name (and unit # (ex. F-8)
- Firefighter location
- Acknowledgement of a team member's low-air warning bell is ringing
- Estimation of how close they are to an exit
- PAR when clear of the IDLH atmosphere

The team should then consider reporting to REHAB if needed before reengaging or receiving a new assignment.

Firefighters exiting prior to their low-air alarm will be allowed to get another bottle and re-enter the work area before going to rehab. If a low-air alarm activates within an IDLH atmosphere, the user shall immediately let their supervisor know what their status is. Command may decide to send the team to rehab since they exceeded the normal work period. Firefighters must report to rehab as required.

Rehabilitation:

Identified work-to-rest intervals should require a 10-minute team rehab including rest, hydration, and a medical evaluation of the team's readiness before re-assignment at the completion of the 10-minute rehab.

Work-to-rest guidelines to be considered:

- One '30-minute' bottle without adhering to the Rule of Air Management
- 20 minutes of intense work
- Two '30-minute' bottles following the Rules of Air Management

After the initial rehab, teams should continue to report to Rehab after each (one) bottle use throughout the remainder of the incident.

Overhaul Policy and the Rules of Air Management:

Overhaul is necessary to assure that the fire is out and will not rekindle. However, the post-fire environment is dangerous due to irritants, toxic gases, and carcinogens in the atmosphere. Teams must wear their SCBA during this overhaul phase of firefighting to protect themselves. The Fire Department's RPP mandates the wearing and use of SCBA during all phases of the fire and adheres to safe and effective air management practices.

Firefighters should follow the Air Management Policy during overhaul. The policy is not to breathe smoke, period.

Firefighters should ensure they are out of the hazardous environment before their low-air alarm warning activates. Again, this gives firefighters a safety margin should they become trapped or lost in the structure.

Monitoring shall be conducted and confirmed all-clear prior to doffing SCBA during overhaul operations.

Emergency Procedures

(See *Firefighter Survival and Rescue Policy Procedure Guideline*)

SECTION 7: MAINTENANCE AND CARE OF RESPIRATORS **1910.134 (h)**

This section of the program follows the intent of the OSHA, the SCBA manufacturer, SCOTT, and NFPA 1404. SCBA and facepieces are to be inspected monthly and checked before and after each use.

The Bristol Fire Department shall provide firefighters with a Self-Contained Breathing Apparatus (SCBA) that is sanitary, and in good working order. Firefighters shall ensure that SCBA and facepieces are cleaned, disinfected and in serviceable condition (inspected) in accordance with Fire Department and manufacturer procedures that comply with [Appendix B-2 to § 1910.134: Respirator Cleaning Procedures \(Mandatory\)](#).

The SCBA and individually assigned facepiece shall be cleaned, disinfected, and inspected at the following intervals:

- a. Following each use, at least monthly and as often as necessary to be maintained in a sanitary in-service condition in accordance with Fire Department [SCBA - Standard Operating Procedures](#) and the manufacturer's, SCOTT Fire & Safety, [Inspection and Cleaning Instructions](#) manual. (h)(3)(i)(A & B)
- b. SCBA shall be stored in apparatus seating positions and compartments. (h)(2)(i)
- c. Facepieces shall be placed in a clean, dry mask bag provided by the Fire Department and stored in a manner which prevents deformation of the face seal, other damage, or contamination.
- d. The RPP Administrator will ensure an adequate supply of appropriate cleaning and disinfection materials are always available. If supplies are low, firefighters are responsible for notifying the RPP Administrator.

Maintenance

1. Respirators are to be properly maintained to ensure that they function properly and adequately to protect the firefighter. Maintenance involves a thorough visual inspection for cleanliness and defects. Worn deteriorated parts will be replaced prior to use. No components will be replaced, or repairs made beyond those recommended by the manufacturer. Repairs to regulators or alarms of atmosphere supplying respirators will be performed by the manufacturer or a person certified by the manufacturer.
2. Air 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. Firefighters qualified to don a SCBA in an IDLH shall determine that the regulator and warning devices function properly.
3. The fire department shall ensure that SCBA that fail an inspection or are otherwise found to be defective are removed from service, and repaired or adjusted in accordance with the following procedures (h)(4):
 - a. Repairs or adjustments to SCBA are to be made only by persons appropriately trained to perform such operations and shall use only the respirator manufacturer's NIOSH-approved parts designed for the respirator. (h)(4)(i)(ii)
 - b. SCBA repairs including but not limited to reducing and admission valves, regulators, and alarms shall be adjusted or repaired only by the manufacturer or a technician trained by the manufacturer or vendor supplying the equipment to the fire department. (h)(4)(iii)
4. On an annual basis each SCBA shall be inspected and maintained by a SCOTT Fire & Safety trained technician. This inspection will be performed following SCOTT guidelines and documented in writing. This testing will incorporate the SCOTT regulator testing equipment. In addition, all annual maintenance procedures as described in NFPA 1404(1989) 6-1.3 will be conducted. The RPP Administrator is responsible for the scheduling and coordination of this annual service.

Inspecting the Respirator Components

Inspect the respirator before each use and after each cleaning.

Performing a General Inspection of the 3M SCOTT AIR-PAK X3 PRO**To inspect the respirator:**

1. Inspect the complete respirator for worn or damaged components.
 - a. Inspect hoses and rubber parts for cracking, splitting, or brittleness.
 - b. Inspect the harness webbing and all elastomeric components for cuts, tears, abrasion, fraying, or indication of heat or chemical damage.
 - c. Check all buckles and fasteners for proper operation.
 - d. Check the cylinder retention system for damage and for proper operation.
 - e. Verify that the respirator has been properly cleaned.
2. Verify that the shoulder harness assembly and waist pad are firmly attached to the back frame.
 - a. Check that all harness sleeves are firmly fastened.
 - b. Verify that the regulator hose, console cable, and gauge line are properly routed through the harness sleeves.
3. Inspect the pressure reducer for damage. Verify that the pressure reducer is securely mounted to the quarter-turn mount on the back frame.
4. Inspect the mask-mounted regulator for damaged or missing components.
 - a. Remove the mask-mounted regulator from the facepiece by pulling back on the regulator latch and rotating the regulator one-quarter turn.
 - b. Verify that the regulator gasket is in place around the outlet port of the regulator. Inspect the gasket for rips or damage that may break the seal.
 - c. Verify that the purge valve (red knob) is not damaged and turns smoothly one-half turn from stop to stop.
5. If you have an approved voice amplifier or other communications device, refer to the user instructions provided with that device for details about maintenance and operational testing. **Always confirm that the device has fresh batteries before use.**

Note: The Bristol Fire Department currently does not provide voice amplifiers.

Inspecting the Breathing Air Cylinder

Inspecting the cylinder includes looking for physical damage, noting the hydrostatic test date, and inspecting the cylinder valve, including the hand wheel, outlet, connector, and relief valve.

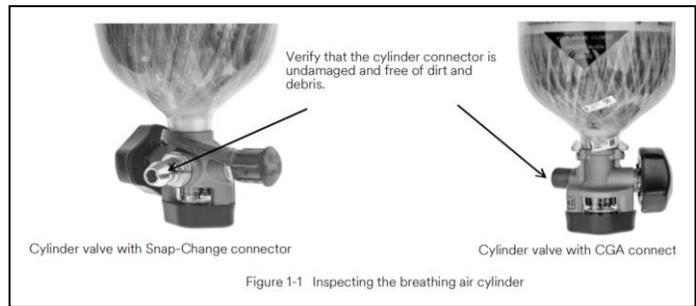
To inspect the breathing air cylinder:

1. Visually inspect the breathing air cylinder and valve assembly for physical damage such as dents or gouges in the metal or the composite wrapping.
Physical damage to breathing air cylinders from high heat, flame, or chemical exposure includes the following:
 - Discoloration or paint that has turned brown or black
 - Charred or missing decals
 - Melted pressure gauge lens
 - Distorted elastomeric bumper
 - Cracks in the cylinder or the composite wrapping
 - Peeling of the outer layers of the composite wrapping
 - Bulging of the cylinder wall

Note: If a cylinder shows any of the physical defects listed, remove it from service and empty it of compressed air.

2. Check the latest cylinder hydrostatic test date to ensure it is current.
The date of manufacture marked on the cylinder is also the date of the first hydrostatic test. All breathing air cylinders used with 3M Scott Air-Pak SCBAs must be visually inspected regularly and hydrostatically tested every five (5) years by a licensed cylinder re-tester.

3. Inspect the cylinder valve. *See Figure 1-1.*
 - a. Check for damage of the cylinder valve hand wheel.
 - b. Inspect the cylinder valve outlet for damage.
 - c. Verify that the CGA threads or Snap-Change connector on the cylinder valve outlet is undamaged and free of dirt and debris.
 - d. Check the relief valve (burst disc) for damage or dirt.
4. Check the cylinder pressure gauge. If the cylinder is less than full, replace it with a fully charged cylinder.

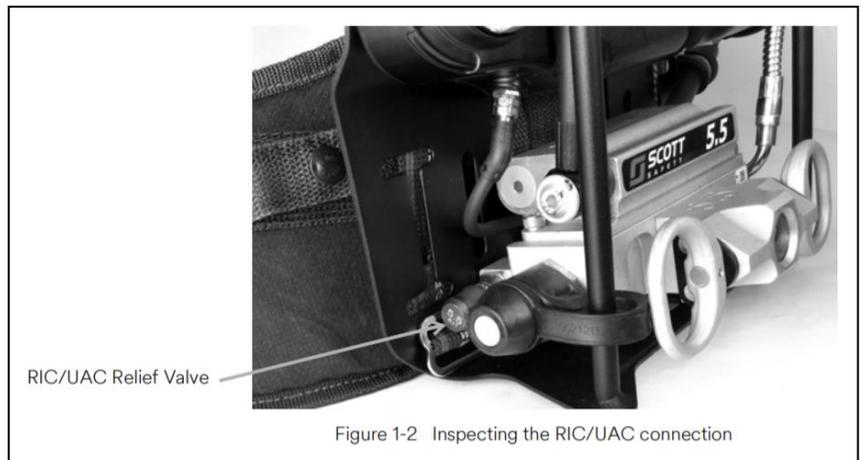


Inspecting the RIC/UAC Connection

3M Scott Air-Pak X3 Pro respirators are fitted with a Rapid Intervention Crew/Company Universal Air Connection (RIC/UAC) system to provide emergency replenishment of an approved SCBA breathing air supply cylinder from an approved air supply source.

To inspect the RIC/UAC connection:

1. Remove the dust cap from the RIC/UAC coupling on the respirator.
2. Visually inspect the coupling for dirt or damage. Remove any dirt or contamination from the coupling. *See Figure 1-2.*
 - a. If the RIC/UAC coupling on the respirator appears damaged, remove the respirator from service and tag it for repair by authorized personnel.
 - b. If you find no damage, replace the dust cap.



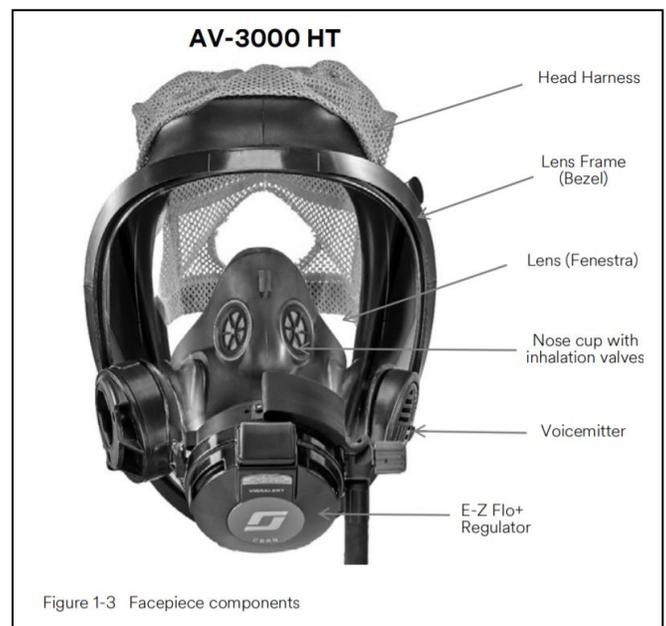
Inspecting the Facepiece

Remove and keep the protective static cling label attached to the lens of a new facepiece; the label may be re-used during storage of the facepiece.

The facepiece must be complete and in serviceable condition with no worn, loose, or damaged components.

To inspect the facepiece:

1. Inspect the facepiece seal and other rubber components for deformation, wear, cracks, or other damage.
2. Inspect the lens and lens frame.
 - a. Inspect the lens for scratches, gouges, cracks, crazing, distortion, melting, or any other damage or condition that could impair the user's vision or the operation of the facepiece.
 - b. Inspect the lens frame for damage such as cracks or distortion.
 - c. Verify that the lens frame screws are present and installed correctly.



3. Inspect the head harness.
 - a. Check that all harness anchors are present and operating properly.
 - b. Inspect the head harness for correct installation with all straps oriented correctly.
 - c. Inspect the head harness for damage or worn components.
4. Inspect the voicemitter ducts.
 - a. Verify that the voicemitter ducts are properly installed.
 - b. Inspect the voicemitters for damage and verify that the voicemitters are properly installed and secure in the voicemitter ducts.
5. Inspect the nose cup.
 - a. Inspect the nose cup for cuts or damage. Look for any signs of damage to the facepiece port side of the nose cup where the regulator attaches.
 - b. Verify that both inhalation valves in the nose cup are present and properly installed.
 - c. Verify that the nose cup is properly installed. Check that the nose cup is properly seated between the flanges of the voicemitter ducts and over the chin cup. *See Figure 1-4.*
6. Verify that the facepiece is clean.
7. Adjust the head straps to the full outward position.

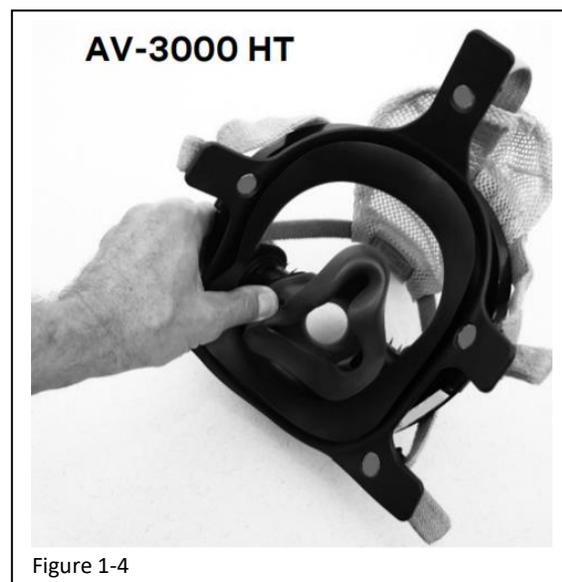


Figure 1-4

Inspecting the Regulator

Inspection of the mask-mounted regulator includes checking the regulator gasket, purge valve, Heads-Up Display (HUD), regulator hose, and quick-disconnect.

To inspect the regulator:

1. Verify that the purge valve (red knob) is not damaged and turns smoothly one-half turn from stop to stop. *See Figure 1-5.*
2. Verify that the regulator gasket is not damaged and is in place around the outlet port of the regulator. *See Figure 1-5.*
3. Inspect the HUD for damage. Verify that the rubber guard is in place and is not torn or damaged.
4. If the hose to the mask-mounted regulator is equipped with a quick-disconnect, inspect both the male and female quick-disconnects. Pay special attention to the following:
 - a. Inspect the operation of the locking sleeve on the female quick-disconnect. If any damage is noted, remove it from service and tag it for repair.
 - b. Inspect the condition of the male quick-disconnect. Look for signs of wear on the locking ridge.
5. Verify that the quick-disconnect operates properly. Mask-mounted regulators equipped with a quick disconnect use a pull-back sleeve coupling.
 - a. While pushing the plug D into the socket, pull the locking sleeve E back toward the guard. The plug D will separate.
 - b. To reconnect, align the HUD plug with the mating connector. A collar on the female coupling prevents misalignment of the connectors. Verify that the HUD plug is properly aligned and fitted into the mating socket.
 - Push plug D into the socket until the locking sleeve E pops forward.
 - Test for proper engagement by tugging on the coupling.

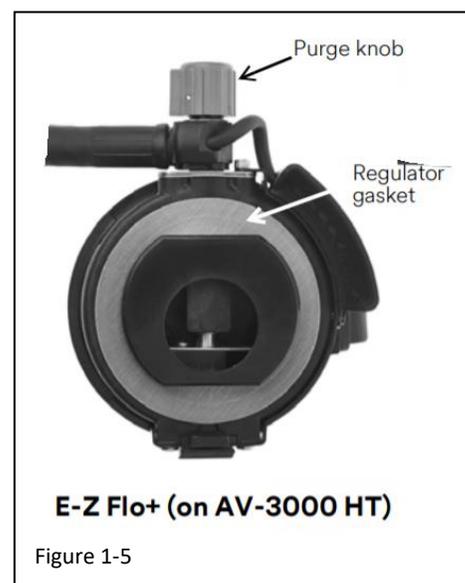


Figure 1-5

6. If the regulator is not attached to the facepiece, proceed as follows:
 - a. Align the regulator outlet port with the facepiece port. (The red purge valve on the regulator will be in the 12 o'clock position). Insert the regulator into the facepiece port.
 - b. Rotate the regulator counterclockwise (as viewed from inside of facepiece) until the red purge valve knob is on the left side of the facepiece. The lock tab of the E-Z Flo+ regulator or the latch on the E-Z Flo C5 regulator will lock into the facepiece retainer with a click. When the lock tab or latch is properly engaged, the regulator will not rotate.
7. Verify that a full cylinder is properly installed in the back frame and that the reducer hose coupling is hand-tightened to the cylinder valve outlet.

Performing Operational Testing

Testing includes checking the basic operation of the respirator, followed by more thorough checks of the regulator, HUD, sensor module lights, and batteries.

General Testing:

1. Check that the mask-mounted regulator purge valve (red knob on regulator) is closed (the pointer on the knob points up).
2. Fully depress the center of the air saver/donning switch on the top of the E-Z Flo+ regulator.
3. Slowly open the cylinder valve by fully rotating the knob counterclockwise (approximately two-and-one-half turns). Confirm that the following occur:
 - The Vibralert alarm sounds and then stops.
 - The HUD initializes.
 - All lights turn on for 20 seconds before displaying the cylinder's air supply level.
 - If the low battery light remains lit or begins to flash, replace the batteries before proceeding.
 - The Scott Air-Pak X3 Pro is equipped with a Personal Alert Safety System (PASS) device, also known as a distress alarm. You will hear three quick chirps when the cylinder valve is opened.
4. Check that the remote pressure gauge is operating properly and that its reading is within 10% of the value on the cylinder pressure gauge.
5. Don the facepiece or hold the facepiece to your face to create a good seal.
 - a. Inhale sharply to automatically start the flow of air. Breathe normally from the facepiece to ensure proper operation.
 - b. Remove the facepiece from your face. Confirm that air flows freely from the facepiece.
6. Fully depress the center of the air saver/donning switch on the top of the E-Z Flo+ regulator. The flow of air from the facepiece will stop.
7. Examine the complete respirator for air leaks. No air should leak from any part of the respirator.

Testing the Regulator

The regulator is equipped with a red purge valve (knob), which allows air to flow into the facepiece in an emergency without breathing on the respirator. The purge control is also used to release residual air from the respirator after the cylinder valve is turned off.

To check the purge valve:

1. Rotate the purge valve one-half turn counterclockwise (turn the valve so that the pointer on the knob points down). Air flows freely from the regulator.
2. Rotate the purge valve one-half turn clockwise to its fully closed position (the pointer on the knob points up). Air flow from regulator stops.
3. Push in and rotate the cylinder valve knob clockwise to close the valve.
4. When the cylinder valve is fully closed, open the purge valve slightly to vent residual air pressure from system. As the residual air pressure vents from the system, the remote pressure gauge needle will swing from full toward empty.
5. Observe the air supply indicator lights of the HUD and verify that they light properly in descending order.

6. When the gauge needle crosses the one-third mark but before it reaches the beginning of the red empty band, close the purge valve. See *Figure 1-8*.

Confirm that the following occur:

- The Vibralert end-of-service indicator alarm sounds (rapid clicking).
- The red light at the far left of the HUD flashes at 10 times per second.
- On units equipped with a PASS device, the gauge light on the remote pressure gauge is solid red.

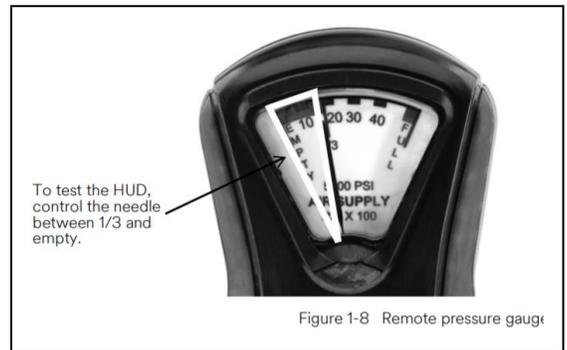


Figure 1-8 Remote pressure gauge

7. After verifying that all alarms are functioning, open the purge valve slightly to vent the remaining residual air pressure from the system. All alarms (except the accessory electronic end-of-service time indicator) stop when the system pressure drops to zero.
8. When air flow stops completely, close the purge valve (the pointer on the knob points up).
9. Stop the electronic end-of-service time indicator by pressing the manual reset (yellow) button on the control console twice and then twice again after the flashing green light sequence.

Testing the Heads-Up Display

The Heads-Up Display (HUD) provides a visual monitor of the air supply in the cylinder and valve assembly. The display is fitted to the mask-mounted regulator and appears across the bottom of the user's field of view through the facepiece.

The HUD consists of four rectangular lights to represent the cylinder pressure at full and three-quarters, one-half, and one-third full. A fifth red light indicates low battery.

The HUD operates as follows:

- When respirator use begins, the HUD will initialize and illuminate all lights for 20 seconds. Verify the operation of all lights every time respirator use starts and with every regular operational inspection.
- After initialization, the rectangular indicator lights show the level of the air supply in the cylinder (*see Figure 1-9*):
 - When the cylinder is more than three-quarters full, two green lights near the center of the display illuminate.
 - When the cylinder is between one-half and three-quarters full, a single green light illuminate.
 - When the cylinder is between one-third and one-half full, a yellow light flashes once per second.
 - When the cylinder is less than one-third full, a red light at the far left of the display (the end-of-service time indicator) flashes 10 times per second.

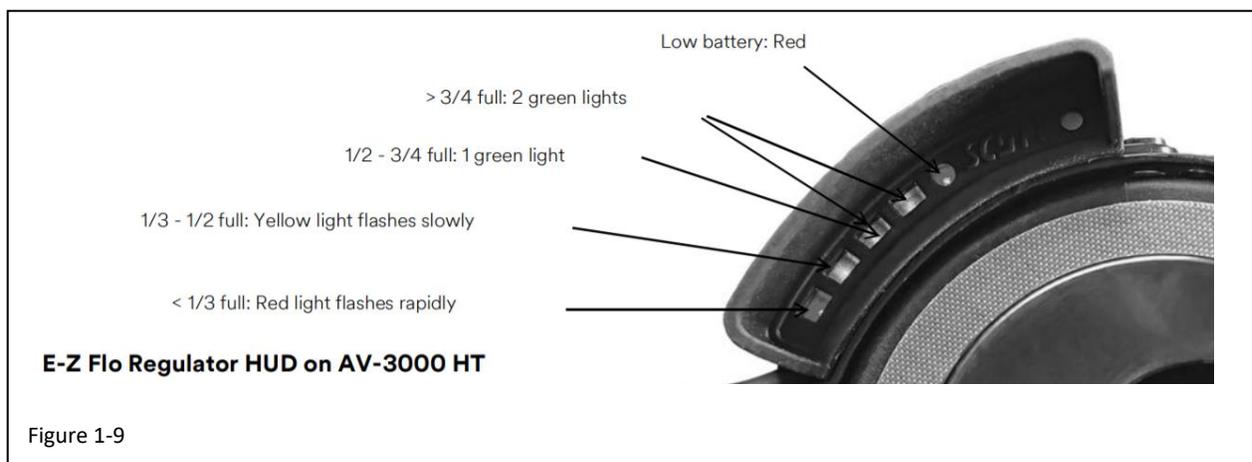


Figure 1-9

- If the SCBA is equipped with a PASS device, the lights in the HUD will flash in an alternating pattern when the distress alarm goes into pre-alarm mode. In addition, the color of the light illuminating the gauge dial will be the same as the current cylinder level light showing in the HUD.

- The HUD has an automatic brightness control that dims the display in low-light situations and returns the display to full brightness in bright-light situations.
- When the batteries require changing, the low-battery indicator at the right of the display lights for 20 seconds and then begin to flash once per second.

When the low battery indicator is actuated, the batteries still have sufficient life to operate the HUD for a period longer than the longest duration cylinder installed on the respirator. However, you must change the batteries immediately upon termination of use of the respirator or before reentry into a hazardous atmosphere.

BEHAVIOR OF LIGHTS	MEANING	USER ACTION
2 glowing green lights	Full Cylinder	Continue using respirator
1 glowing green light	3/4 full Cylinder	Continue using respirator
1 slowly flashing yellow light	1/2 full Cylinder	Continue using respirator
1 rapidly flashing red light	1/3 full Cylinder	Leave hazardous area immediately

Table 1-1 Heads-Up Display Indicator Lights

Testing the Sensor Module Lights

When performing operational testing on the Scott Air-Pak X3 Pro, verify that the sensor module lights are operating properly. *Figure 1-10* shows the sensor modules on the respirator, and Table 1-2 describes how the lights behave for actions or situations.

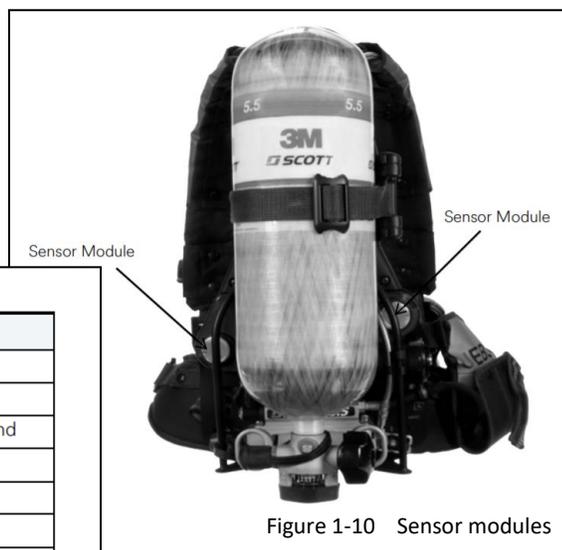


Table 1-2 Operation of Sensor Module Lights

ACTION OR SITUATION	BEHAVIOR OF LIGHTS
Start Air-Pak SCBA (i.e., open cylinder valve)	Bright light, then flashing green light
Normal operation	Flashing green light
Air cylinder between 1/2 and 1/3 full	Flashing yellow light (2 quick flashes) every second
Air cylinder less than 1/3 full (low air)	Flashing yellow light (alternately)
Low battery while unit is on	Flashing yellow light once every 2 seconds
Shut down	Off
Press reset button on control console with unit off (battery test)	Good battery: Bright light, then flashing green light Low battery: Bright light, then flashing red light
Press manual alarm button on control console with unit off	Flashing red light (simultaneously)
Press reset button on control console during full alarm	Flashing green light
PASS pre-alarm	Flashing red light (alternately)
PASS full alarm	Flashing red light (simultaneously)

Testing the Batteries

Performing a manual battery condition test:

1. Make sure the distress alarm is off (i.e., the cylinder valve is closed, and no sensor module lights are flashing).
2. Press and hold the manual reset (yellow) button on the console. Observe the final light color (green or red) in the sequence to determine the battery status.
 - Green lights on the control console and sensor module indicate that sufficient battery power remains.
 - Red lights on the control console and sensor module indicate that the batteries are low and must be replaced before the respirator is used again. 3M recommends replacing all batteries before the respirator is used again.

Soft Goods Assembly & Disassembly

(Refer to Chapter 2 of the [Air-Pak X3 Pro SCBA Inspection and Cleaning Manual](#))

Cleaning the Respirator

Because the cleaning procedures involve the use of liquids, respirators stored or used at cold temperatures must be warmed before cleaning. Respirators being used at cold temperatures after cleaning must be completely dry.

To clean the respirator:

1. Using a damp sponge, wipe any accumulated dirt from the exterior of the respirator.
Note: The light sensor for the HUD brightness control is located on the front of the remote gauge housing. Be sure to clean the front of the remote gauge housing to enable proper functioning of the sensor.
2. Clean the facepiece and mask-mounted regulator (see “*Cleaning the Facepiece*” and “*Cleaning the Mask-Mounted Regulator*”).
*Note: You can remove the shoulder harness and waist pad assemblies for decontamination or laundering (see “*Soft Goods Assembly & Disassembly*” and “*Cleaning the Shoulder Harness and Waist Pad*”).*

Cleaning the Facepiece**Supplies needed:**

- ✓ 3M-approved sanitizing or disinfecting cleaner.
- ✓ Spray bottle
- ✓ Drinking (potable) water
- ✓ Clean, lint-free cloth
- ✓ (Optional) Lubricant-free, dry breathing air, maximum 30 PSIG, for drying facepiece

To Clean the Facepiece:

1. Remove the mask-mounted regulator from the facepiece.
Note: A nose cup is designed to be an integral part of the facepiece and does not need to be disassembled for cleaning unless the facepiece is heavily soiled.
2. If the facepiece is heavily soiled, you want to first wash the facepiece with a solution of mild soap or detergent in warm water (110° F / 43° C maximum).
 - Using a spray bottle, apply a solution of mild soap or detergent in warm water (110° F / 43° C maximum) to the soiled surfaces. Rinse the facepiece with drinking water either from a faucet or in a spray bottle.

-OR-

 - Clean the facepiece using 3M-approved cleaning wipes.
3. To sanitize or disinfect the facepiece, use a spray bottle to apply the recommended sanitizing or disinfecting cleaner to all surfaces of facepiece. Be sure to cover all surfaces completely with the cleaning solution.
Note: The Kevlar head harnesses are made of porous material. The recommended cleaner may not be effective on porous material.
4. Set the facepiece aside for the required contact time prior to rinsing. **The hypochlorite solution and the aqueous solution of iodine require a 2-minute contact time.**
5. Rinse the facepiece with drinking water either from a faucet or in a spray bottle.
6. Shake excess water off the facepiece and dry it with a clean, lint-free cloth or gently blow dry with clean, dry breathing air of 30 PSIG or less pressure. Do not use shop air or any other air containing lubricants or moisture.

Cleaning the Mask-Mounted Regulator

Needed supplies:

- Sanitizing or disinfecting cleaner. 3M recommends a properly diluted hypochlorite solution or aqueous solution of iodine:
 - Hypochlorite solution (50 ppm of chlorine) made by adding approximately one milliliter (1 mL) of laundry bleach to one liter (1 L) of water at 110° F / 43° C

OR

- Aqueous solution of iodine (50 ppm iodine) made by adding approximately 0.8 mL of tincture of iodine (6-8 grams ammonium and/or potassium iodide/100 cc of 45% alcohol) to 1 L of water at 110° F / 43° C
- Spray bottle (for the sanitizing or disinfecting cleaner)
 - Sponge or soft cloth
 - Drinking (potable) water, either from a faucet or in a spray bottle
 - (Optional) Lubricant-free, dry breathing air, maximum 30 PSIG, for drying the regulator

To clean the mask-mounted regulator:

1. Remove the mask-mounted regulator from the facepiece by engaging the lock tab of the E-Z Flo+ regulator.
2. Using a sponge or soft cloth and the recommended sanitizing or disinfecting cleaner, wipe the external surfaces of the regulator.
3. Inspect the inside of the regulator assembly through the regulator opening (*see Figure 3-1*). If excessive dirt or soil is present, forward the regulator assembly to 3M-trained authorized personnel for thorough cleaning.
4. Engage the lock tab. Close the purge knob by turning it fully clockwise.
5. Using a spray bottle, apply the sanitizing or disinfecting cleaner to the surfaces of the regulator opening and the immediate area around the opening (*see Figure 3-1*). Be sure to cover the internal components completely with the cleaning solution.
6. Set the regulator aside for the required contact time prior to rinsing. **The hypochlorite solution and the aqueous solution of iodine require a 2-minute contact time.**
7. Using gently running tap water or a spray bottle with drinking water, rinse the regulator inside and out.
8. Shake excess water out of regulator. **Completely air dry the regulator before use.**
Note: To speed drying of the regulator, gently blow dry with clean, dry breathing air of 30 PSIG maximum. Do not use shop air or any other air containing lubricants or moisture.
9. If the regulator was disconnected from the air supply for cleaning, reconnect and open the purge valve to remove any moisture from regulator spray bar. Close the purge valve.
10. Perform a regulator check after each cleaning (*see "To perform a regulator check"*).

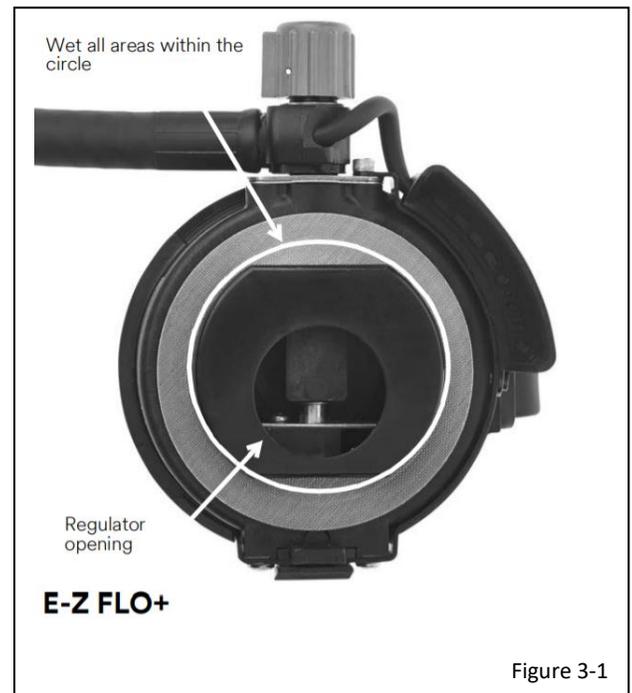


Figure 3-1

To perform a regulator check:

1. Make sure the respirator cylinder is at least 1/2 full to prevent the Vibralert from initiating and obscuring the sound of air flowing from the regulator.
Note: If the cylinder is 1/3 full or less, the Vibralert will initiate. If the Vibralert does not initiate, tag the unit for repair, and remove it from service.

2. Verify that the air saver/donning switch is depressed on the E-Z Flo+ regulator or the auto air-saver switch is engaged on the E-Z Flo C5 regulator latch.
3. Close the purge knob.
4. Reattach the regulator to the respirator (if removed for cleaning).
5. Slowly open the cylinder valve at least 1 full turn.
6. If you hear air flowing from the regulator, close the cylinder valve and repeat steps 2 through 5. If you still hear air flow, close the cylinder valve fully, tag the unit for repair, and remove it from service.
7. Open the purge valve and observe the air flow from the regulator spray bar. Droplets of water indicate the regulator is not dry. Dry the regulator according to step 8 of *“To clean the mask-mounted regulator”* and repeat the regulator check.

Cleaning the Shoulder Harness and Waist Pad

You may clean the 3M Scott Air-Pak X3 Pro soft goods — shoulder harness, waist pad, and straps — using a sponge and/or scrub brush (for spot cleaning) or in the fire department extractor (for machine washing).

In accordance with NFPA 1851 (*Standard on Selection, Care, and Maintenance of Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting*), 3M recommends the following for cleaning the shoulder harness and waist pad:

- Use a mild, **liquid** laundry detergent with a **pH ranging from 6.0 to 10.5** for spot treating or machine washing. Consult the detergent’s Material Safety Data Sheet (MSDS) for pH information. You may also use 3M™ 504 Respirator Cleaning Wipes or commercially available baby wipes to remove debris prior to cleaning.
- Use warm water with a temperature of **40 degrees C (105 degrees F) or less** for rinsing or washing.

WARNING: Do not use chlorine bleach, chlorinated solvents, high-pressure water jets, or power washers to clean the shoulder harness and waist pad. Do not dry clean. Any of these practices may damage the material, putting you at risk for serious injury or death.

Spot Cleaning the Shoulder Harness and Waist Pad

Spot clean light spots or stains on the shoulder harness, waist pad, or straps. If you need to remove the soft goods from the back frame before spot cleaning, see *“Chapter 2: Soft Goods Assembly & Disassembly”* on page 25 of the [Air-Pak X3 Pro SCBA Inspection and Cleaning Manual](#).

To spot clean the shoulder harness and waist pad:

1. Brush and/or rinse off any debris.
2. Apply the cleaning solution to the soiled areas according to the manufacturer’s instructions. Scrub the soiled areas using a sponge or a soft-bristled brush such as a toothbrush or nail brush.
3. Rinse the area thoroughly with water.
4. Repeat steps 3 and 4 as needed for heavily soiled areas.
5. Set the soft goods aside to air dry (see *“Drying the Shoulder Harness and Waist Pad”* on page 49 of the [Air-Pak X3 Pro SCBA Inspection and Cleaning Manual](#)).

Machine (Extractor) Washing the Shoulder Harness and Waist Pad

Extractors wash the shoulder harness, waist pad, and straps to remove dirt and stains.

- Clean all 3M Scott Air-Pak X3 Pro soft goods at least once every year.
- Place all soft goods in a mesh bag (P/N 31004024) before extractor washing.
- Use the fire department front-loading extractor.

To extractor wash the shoulder harness and waist pad:

1. Detach the shoulder harness, waist pad, and straps from the back frame (see “Soft Goods Assembly & Disassembly” on page 25 of the [Air-Pak X3 Pro SCBA Inspection and Cleaning Manual](#)).
2. Perform a visual inspection for soiling, contamination, physical damage, or thermal damage (see “Performing a General Inspection” on page 12 in Chapter 1: Inspecting the Respirator in the [Air-Pak X3 Pro SCBA Inspection and Cleaning Manual](#)).
3. If necessary, spot treat any heavily soiled areas (see “Spot Cleaning the Shoulder Harness and Waist Pad” on page 47 of the [Air-Pak X3 Pro SCBA Inspection and Cleaning Manual](#)).
4. Close all fasteners (snaps and buckles) on the shoulder harness and waist pad assemblies, paying special attention the following:
 - Remove the regulator holder from the waist belt.
 - Carefully pull the waist belt (on the side with the female buckle component) through the openings of the regulator holder.
 - Set the regulator holder aside.
 - Buckle the male and female ends of the waist belt.
 - Attach the waist pad retaining strap to the waist pad. Be sure to thread both ends through the sewn loops on the waist pad and snap them in place on the waist pad.
5. Place the soft goods in the mesh bag. Tighten the bag’s drawstrings and load the bag into the extractor. Do not overload the extractor.
6. Follow fire department standard operating procedures for adding laundry detergent and selecting the appropriate cycle.
7. Inspect the soft goods and rewash them if necessary.

Drying the Shoulder Harness and Waist Pad

3M recommends air-drying the shoulder harness, waist pad, and straps. Machine drying — even using the dryer’s “air dry” or “no heat” setting — is not recommended.

To dry the shoulder harness and waist pad:

1. **Air dry** the shoulder harness and waist pad by hanging them in a well-ventilated area out of direct sunlight.
2. Be sure to dry the soft goods thoroughly before storing.

Replacing Batteries in PASS

The 3M Scott Air-Pak X3 PRO is equipped with a PASS device and requires 6 AA batteries for operation. The 6 batteries power both the Heads-Up Display (HUD) and the PASS device; separate batteries in the gauge console are not required. Only a trained operator should replace batteries in a clean, nonflammable area.

To replace the batteries:

1. Close the respirator cylinder valve and open the regulator purge valve to let out all the trapped air.
2. Close the regulator purge valve.
3. Press the manual reset (yellow) button on the remote pressure gauge console twice.
Note: A 15-second beep sequence may occur as the residual air bleeds off. The unit will sound a 2-tone chirp as the electronics are deactivated, and the green light will go out.

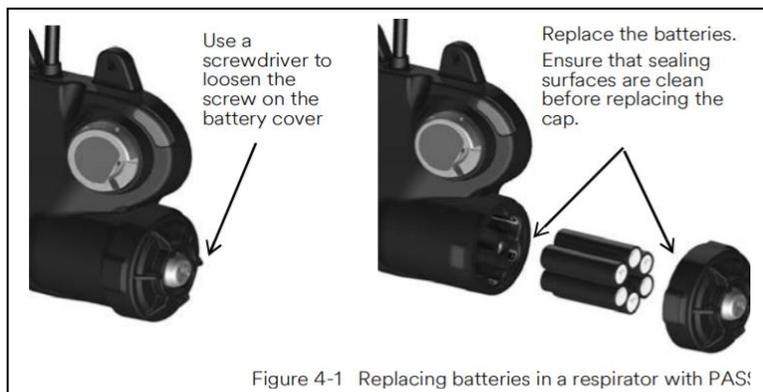


Figure 4-1 Replacing batteries in a respirator with PASS

4. Remove the cylinder.
5. Using a Phillips screwdriver, remove the screws of the battery housing cover as shown in *Figure 4-1*. Carefully remove the cover and set it aside.
6. Remove the used batteries by sliding them out of the battery compartment.

7. Install 6 new AA batteries of the same type. The battery holder is marked with the required style and orientation of the batteries.

To maintain intrinsic safety, use 6 of one of the following types of 1.5 volt AA batteries:	
Duracell Alkaline MN1500	Duracell Quantum QU1500
Duracell Alkaline MX1500	Energizer Alkaline EN91
Duracell Alkaline PC1500	Energizer Alkaline E91

8. Verify the correct orientation of batteries as shown on label inside the battery holder.
9. To ensure that the battery cover is water-tight after replacement, clean the sealing rib around the battery compartment and sealing face of the cover by wiping with a clean damp to remove any dirt or foreign matter that might prevent a proper seal.
10. Check the cover gasket for tears or cuts. If you find damage, remove the respirator from service and tag it for repair by authorized personnel.
11. To install the battery cover, align the three grooves on the cover with the three tabs on the battery compartment. Using a Phillips screwdriver, tighten the cover screw to 13-15 in-lbs. torque.
Note: When the batteries are properly installed and the battery covers are placed in position, all lights in the HUD will light for approximately 20 seconds to verify operation.
12. Before returning the respirator to service, perform a regular operational check (see “Chapter 1: Inspecting the Respirator” on page 11 of the [Air-Pak X3 Pro SCBA Inspection and Cleaning Manual](#)).

SECTION 8: BREATHING AIR QUALITY AND USE *1910.134 (i)*

Compressed breathing air in the Self-Contained Breathing Apparatus (SCBA) cylinder 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. Hydrocarbons (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 a noticeable odor.

The purity of the air from the Fire Department's air compressor shall be checked annually by a competent laboratory. The RPP Administrator shall coordinate air testing. A copy of the air quality certificate shall be displayed on next to the containment system. When an air sample fails all SCBA cylinders shall be emptied and refilled from another source.

The Fire Department shall use carbon air cylinders with thirty (30) minute duration (based on NIOSH breathing rates). These carbon air cylinders are tested and maintained as prescribed in the Shipping Container Specification Regulations of the Department of Transportation (49 CFR part 180). (i)(4)

Hydrostatic testing shall be performed every five (5) years from date of manufacturing and the cylinder shall be removed from service fifteen (15) years from date of manufacturing.

The Fire Department shall assure that a reserve air supply is available by use of reserve air cylinders.

Air cylinders shall be filled only by personnel who have been trained on the Fire Department's [Fill Station - Standard Operating Procedure](#) and equipment. The SOP and safety precautions are posted in the Fire Station-Air Room.

See **Appendix - G** for the [Air Fill Station Record](#)

SECTION 9: TRAINING PROGRAM FOR RESPIRATOR USE **1910.134 (k)**

The training program for the respiratory protection program (RPP) and SCBA use is divided into two types: Initial and Refresher.

Initial training is applicable to all new employees (recruit firefighters) and is provided prior to respirator use in the workplace (k)(3). The usual and customary practice for providing this training is the Vermont Fire Service Training Council Fire Fighter 1 curriculum and certification program supplemented by Fire Department specific information and practice with the SCBA. Recruit firefighters trained within the past 12 months may proficiency test out of required training (k)(4). This proficiency testing is outlined in the fire department's training program.

Refresher training is applicable to all employees (firefighters) who have received initial training and are required to use SCBA as a part of their job function. Refresher training must be comprehensive, understandable, and occur annually, and more often if necessary. The Fire Chief, RPP administrator, or a supervisor can require refresher training other than on an annual basis. The need can be based on changes in workplace that make old respirators obsolete, knowledge or use of the SCBA indicate that the firefighter has not retained the requisite understanding or skill; or any other situation arises in which retraining appears necessary to ensure safe SCBA use (k)(5).

The initial and refresher training program shall include, but not be limited to, the following components that each employee (firefighter) must demonstrate knowledge of (k)(1):

- 1. Why the SCBA is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the unit.**
- 2. What the limitations and capabilities of the SCBA are.**
- 3. How to use the SCBA effectively in emergency situations, including situations in which the SCBA malfunctions.**
- 4. How to inspect, don, doff, use, and check the seals of the SCBA.**
- 5. What the procedures are for maintenance and storage of the SCBA.**
- 6. How to recognize medical signs and symptoms that may limit or prevent the effective use of SCBA.**
- 7. The general requirements of 1910.134(k) and NFPA 1404 Section 5.2.**

Both initial and refresher training shall be conducted in a manner that is understandable to the employee (firefighter) and prior to requiring the firefighter to use a SCBA (k)(2)(3).

As part of the initial and refresher training programs, firefighters shall participate in and successfully complete the following skills:

- **Donning and doffing**
- **Care and maintenance**
- **Emergency skills**
- **Consumption exercises (Air Management)**
- **Simulated work, including basic tasks and strenuous activities.**

All personnel required to use SCBA as a part of their job function, at least annually, must demonstrate their knowledge, skills, and abilities related to the use of SCBA in accordance with this RPP and the BFD Training Program.

See **Appendix - E** for the Annual Respiratory Protection (SCBA) Training Compliance Record

All personnel required to use SCBA as a part of their job function, must successfully complete the Bristol Fire Department - Firefighter Confidence Course annually.

See **Appendix - F** for the Firefighter Confidence Course Record

SECTION 10: PROGRAM EVALUATION 1910.134 (I)

The Fire Department shall conduct workplace evaluations as necessary to ensure that the written Respiratory Protection Program (RPP) is comprehensive, effective, and is being properly implemented. Part of these evaluations shall be regularly consulting employees (firefighters) to assess views and identify problems (I)(1)(2).

Factors to be assessed include, but are not limited to:

- Respirator fit, proper and unimpaired
- Respirator proper for hazard
- Respirator training
- Respirator maintenance

The Fire Department shall regularly consult employees (firefighters) required to use respirators to assess the firefighters' views on program effectiveness and to identify any problems. Any problems that are identified during this assessment shall be corrected. (L)(2)

Factors to be assessed include, but are not limited to:

- Respirator fit (including the ability to use the respirator without interfering with effective workplace performance). (L)(2)(i)
- Appropriate respirator selection for the hazards to which the employee is exposed. (L)(2)(ii)
- Proper respirator use under the workplace conditions the employee encounters. (L)(2)(iii)

Additionally, the RPP shall evaluate SCBA maintenance procedures and practices to ensure that this plan, the OSHA regulations and manufacturer's instructions and recommendations are complied with. (L)(2)(iv)

When the need for improvement or corrective action is required it shall be taken as soon as possible. Changes in policy or procedure will be preceded by the appropriate changes to this program, which are then communicated to all employees (firefighters), and any necessary training conducted.

SECTION 11: RECORDKEEPING 1910.134 (m)

Medical records are kept in accordance with OSHA regulation 29 CFR 1910.1020. (m)(1)

Minimal medical records are maintained by the Fire Department. The issued report on ability or inability to use a respirator does not contain medical condition, medication, physical findings, or the like, regarding the employee. All medical records detailing any medical evaluation are held in confidentiality by the PLHCP. In addition, any copies released to the fire department are done with the consent of the employee (firefighter) and held in a sealed security envelope for use in an emergency. Employees (firefighters) who desire a copy of their medical record should contact the PLHCP for such.

- The most current fit test form shall be retained until next fit test is performed. (m)(2)(ii)
Note: Previous versions may be maintained but are not required to be.
- The monthly inspection records shall be kept until the next inspection.
- A written copy of the current RPP shall be retained. (m)(3)
Note: Previous versions may be maintained but are not required to be.
- All records (including medical records detailing medical examinations or evaluations) must be presented to OSHA upon request. (m)(4)

APPENDIX - A

OSHA Respirator Medical Evaluation Questionnaire

(see Respirator Protection Program Administrator for a copy of the medical evaluation questionnaire)



APPENDIX - B

To: Physician or other Licensed Health Care Professional (PLHCP) performing a medical evaluation for respirator use.

Subject: Required Supplemental Information for the PLHCP

Type and Weight of respirator:	SCOTT AIR-PAK X3 PRO Self-Contained Breathing Apparatus (SCBA). SCBA weighs approximately 25 pounds.
Duration and frequency of use:	Varies. Approximately once every 14 days for 10-45 minutes.
Expected physical work effort:	From minimal (walking with SCBA on back) to maximal (performing rescue of victim under heat and smoke)
Additional protective clothing and equipment to be worn:	Turnout coat/pants, boots, helmet, gloves, and carbon hood
Temperature and humidity extremes to be encountered:	Minus 30 degrees F to 400+ degrees F with up to 100% humidity.

The Firefighter Position (Job) Description provides extensive detail of job requirements including the Essential Job Functions.

The PLHCP evaluating Town of Bristol Fire Department Recruit/Firefighters shall be provided with the supplemental information outlined above, a copy of the Fire Department's Respiratory Protection Program and a copy of the *Supplemental Information for the PLHCP* section of: OSHA [29 CFR 1910.134\(e\)\(5\)](#).

Medical Determination

Upon completion of the medical evaluation the PLHCP shall provide to the Fire Chief a written recommendation regarding the Recruit/Firefighter's ability to use a Self-Contained Breathing Apparatus (SCBA) in Emergency and Training operations.

The recommendation shall provide only the following information:

1. Any limitations on SCBA use related to a medical condition of the firefighter or relating to the workplace conditions in which the SCBA will be used, including whether the firefighter is medically able to use the SCBA.
2. The need, if any, for follow-up medical evaluations; and
3. A statement that the PLHCP has provided the firefighter with a copy of the PLHCP's written recommendation.

The written recommendation shall be on the form contained in **APPENDIX - C** of this program or on a form or letterhead of the PLHCP that contains only the information stated above.



APPENDIX - C

Written Recommendation by PLHCP Regarding the Employee's Ability to use a Self-Contained Breathing Apparatus (SCBA)

Name of Firefighter (Recruit):
Date of Medical Evaluation:
<input type="checkbox"/> This firefighter (recruit) is NOT medically able to use a respirator. <input type="checkbox"/> This firefighter (recruit) IS medically able to use a respirator.
Limitations on Self-Contained Breathing Apparatus use related to a medical condition of the firefighter (recruit). _____ _____ _____ _____
Limitations on SCBA use relating to the workplace conditions in which the SCBA will be used. _____ _____ _____ _____
<input type="checkbox"/> There is NO NEED for any follow-up medical evaluations currently. <input type="checkbox"/> There is a NEED for a follow-up medical evaluation(s) currently.
<i>I have provided the firefighter (recruit) with a copy of my written recommendation.</i>
Signed: _____ Date: _____
Printed Name:
<input type="checkbox"/> Physician <input type="checkbox"/> Licensed Healthcare Professional (stage type):
Address:
Town/City, State, ZIP:
Phone number:



APPENDIX - D

Respirator Fit Test Record

Name (Employee): _____

Name (Fit Test Technician): _____

Type of Fit Test: Initial Annual Other

Date of Fit Test: _____

Fit Test Result: Passed Failed

Fire Chief: X _____ Date: _____

Chief/Company Officer: X _____ Date: _____

NOTE: The Bristol Fire Department will use the quantitative fit testing (QNFT) method that complies with [Appendix A to §1910.134 - Fit Testing Procedures \(Mandatory\)](#).



APPENDIX - E

Annual Respiratory Protection (SCBA) Training Compliance Record

 Employee Name
Option 1

Employee has completed an approved VT Fire Service Training Council *Firefighter 1* program, has received, and maintains a valid certification, has demonstrated the knowledge, skills, and abilities outlined in the **Bristol Fire Department - Respiratory Protection Program (Section 9)**, and has demonstrated skill proficiency in the use of Self-Contained Breathing Apparatus (SCBA) as outlined in the **Bristol Fire Department - Training Program** for the position (function) of **Firefighter**.

 Fire Chief

 Proctor

 Date Completed
Option 2

Employee has completed an approved VT Fire Service *Essentials of Firefighting* training curriculum, received certification, has demonstrated the knowledge, skills, and abilities outlined in the **Bristol Fire Department - Respiratory Protection Program (Section 9)**, and has demonstrated skill proficiency in the use of Self-Contained Breathing Apparatus (SCBA) as outlined in the **Bristol Fire Department - Training Program** for the position (function) of **Firefighter**.

 Fire Chief

 Proctor

 Date Completed
Option 3

Employee has completed an approved VT Fire Service Training Council *Firefighter 1* program, received, and maintains a valid certification, and has demonstrated skill proficiency in the use of Self-Contained Breathing Apparatus (SCBA) as outlined in the **Bristol Fire Department - Training Program** for the position (function) of **Exterior Firefighter**.

 Fire Chief

 Proctor

 Date Completed



APPENDIX - H

Confidence course

The Bristol Fire Department confidence course consists of seven (7) events. The confidence course is a sequence of events requiring prospective candidates and firefighters to progress along a predetermined path from event to event in a continuous manner. This course was developed to allow the department to identify trainable candidates and to ensure current firefighters are physically able to perform essential job performance requirements.

A Firefighter's ability to work under strenuous conditions while wearing a Self-Contained Breathing Apparatus (SCBA) and performing essential job performance requirements during training and fire scene operations is essential. This course is designed to demonstrate proficiency, build confidence, and identify training needs.

You are required to demonstrate competency and proficiency in wearing and use of an SCBA under physically stressful conditions as well as complete all course objectives in compliance with current training practices.

Required clothing:

Candidate: In these events, you wear a 50-pound (22.68-kg) vest to simulate the weight of self-contained breathing apparatus (SCBA) and firefighter protective clothing.

Throughout all events, you must wear long pants, a hard hat with chin strap, work gloves and footwear with no open heel or toe. Watches and loose or restrictive jewelry are not permitted.

Firefighter: Throughout all events, you wear a protective ensemble for structural firefighting and SCBA meeting current standards.

Each event was designed to obtain the necessary information regarding your physical abilities and limitations. The tools and equipment were chosen to provide the highest level of consistency, safety, and validity in measuring your physical abilities. The course layout may vary to conform to the department's test area. The events and distances between events are always the same.

The events are placed in a sequence that best simulates fire scene events allowing an 85' foot walk between events. To ensure the highest level of safety and to prevent exhaustion, no running is allowed between events. This walk allows you approximately 20 seconds to recover and regroup before each event.

Event 1: Training Tower Stair Climb (off-air)

Equipment

This event uses a set of stairs. A single handrail on the wall side is available for you to grasp while climbing and descending stairs.

Purpose of Evaluation

This event is designed to simulate the critical tasks of climbing stairs in full protective clothing while carrying a high-rise pack (hose bundle) and climbing stairs in full protective clothing and SCBA (off air). This event challenges your aerobic capacity, lower body muscular endurance and ability to balance. This event affects your aerobic energy system as well as the following muscle groups: quadriceps, hamstrings, glutes, calves, and lower back stabilizers.

Event

For this event, the firefighter must climb the fire station training tower staircase wearing turnout gear and SCBA (off-air) with high-rise pack placed on shoulder. You must complete five (5) circuits (up and down = 1 circuit). During the stair climb, you are permitted to touch the wall or grasp the handrail for balance.

This concludes the event. Walk 85' feet within the established walkway to the next event.

Event 2: Fire Hose Drag/Pull (off-air)

Equipment

This event uses an uncharged 100' foot length of 1 ¾" fire hose. The fire hose is marked at 8' feet past the coupling to indicate the maximum amount of hose you are permitted to drape across your shoulder or chest.

Purpose of Evaluation

This event is designed to simulate the critical tasks of dragging an uncharged hose line from the fire apparatus to the fire occupancy and pulling an uncharged hose line around obstacles while remaining stationary. This event challenges your aerobic capacity, lower body muscular strength and endurance, upper back muscular strength and endurance, grip strength and endurance, and anaerobic endurance. This event affects our aerobic and anaerobic energy systems as well as the following muscle groups: quadriceps, hamstrings, glutes, calves, lower back stabilizers, biceps, deltoids, upper back, and muscles of the forearm and hand (grip).

Event

For this event, the firefighter shall drag and pull a 100' foot length of 1 ¾" inch fire hose. Place the end of the fire hose over your shoulder and down across your chest and grip the hose no more than 2' feet past the coupling. While walking, drag the fire hose 50' feet to a pre-determined fixed object (e.g., barrel or pole), make a 90 degree turn around the object, and continue walking an additional 50' feet and stop inside the 5' foot by 7' foot box marked out on the floor. Once in the box, turn your body 180 degrees, drop to at least one knee, and pull all 100' feet of the fire hose until it crosses the front line of the box in which you are kneeling in. During the fire hose pull, you must keep at least one knee in contact with the ground and remain within the marked boundary lines. This concludes the event.

Walk 85' feet within the established walkway to the next event.

Event 3: Equipment Carry (off-air)

Equipment

This event utilizes two fire service saws (rescue saw, and ventilation saw) and a portable fire service workbench replicating a compartment shelf on a fire truck.

Purpose of Evaluation

This event is designed to simulate the critical tasks of removing power tools from a fire apparatus, carrying them to the emergency scene and returning the equipment to the fire apparatus. This event challenges your aerobic capacity, upper body muscular strength and endurance, lower body muscular endurance, grip endurance, and balance. This event affects your aerobic energy system as well as the following muscle groups: biceps, deltoids, upper back, trapezius, muscles of the forearm and hand (grip), glutes, quadriceps, and hamstrings.

Event

For this event, the firefighter is required to remove two fire service saws from a simulated cabinet shelf and carry them a total of 150' feet. The firefighter will remove one saw at a time from the simulated cabinet shelf and set it on the ground. Next the firefighter will pick up both saws and walk 75' feet to an object (barrel or traffic cone), make a 180 degree turn around the object, and continue walking an additional 75' feet to the finish line. You are permitted to set the saw(s) on the ground and adjust your grip if needed. Upon return to the simulated cabinet shelf, place both saws on the ground and then picking up each saw one at a time, place them on the simulated cabinet shelf. This concludes the event.

Walk 85' feet within the established walkway to the next event.

Event 4: Ladder Raise and Extension (off-air)

Equipment

This event uses a 16' foot fire department roof ladder and a 28' foot fire department extension ladder. For your safety, two firefighters will heel both the 28' foot ladder and the 16' foot ladder and stabilize ladder as it is being raised and lowered and assist as needed.

Purpose of Evaluation

This event is designed to simulate the critical tasks of placing a ground ladder at a fire structure and extending the ladder to the roof or window. This event challenges your aerobic capacity, upper body muscular strength, lower body muscular strength, balance, grip strength, and anaerobic endurance. This event affects your aerobic and anaerobic energy systems as well as the following muscle groups: biceps, deltoids, upper back, trapezius, muscles of the forearm and hand (grip), glutes, quadriceps, and hamstrings.

Event

For this event, the firefighter must pick up a 16' foot roof ladder, carry ladder to the structure, place the butt end of ladder against structure (or designated assist), rotate ladder so that both spurs contact the ground and the structure, and then lay ladder flat on ground. Grasp a rung near the tip, bring that end of the ladder to chest height, and push upward on the rungs. Walk toward the structure, lifting the rungs hand over hand until the ladder is vertical against the structure and then pull the butt away from structure to approximately 75 degrees. Next you will extend the 28' foot extension ladder which is pre-positioned against structure, using hand over hand method, and then tying off with Clove Hitch and Safety Knot.

Walk 85' feet within the established walkway to the next event.

Event 5: Ventilation (on-air)

Equipment

This event uses a sledgehammer and a tractor tire.

Purpose of Evaluation

This event is designed to simulate the critical tasks of using force to open a locked door or to breach a wall. This event challenges your aerobic capacity, upper body muscular strength and endurance, lower body muscular strength and endurance, balance, grip strength and endurance, and anaerobic endurance. This event affects your aerobic and anaerobic energy systems as well as the following muscle groups: quadriceps, glutes, triceps, upper back, trapezius, and muscles of the forearm and hand (grip).

Event

For this event, the firefighter must use an 8-pound sledgehammer to strike the tire moving it 18" inches. After the tire has been moved the pre-determined distance, place the sledgehammer on the ground. This concludes the event.

Walk 85' feet within the established walkway to the next event.

Event 6: Confined Space (on-air)

Equipment

This event uses a 15' foot culvert that is 24" inches in diameter.

Purpose of Evaluation

This event is designed to simulate the critical task of moving through an enclosed space while using your SCBA air supply. This event challenges your aerobic capacity, upper body muscular strength and endurance, agility, balance, anaerobic endurance, and kinesthetic awareness. This event affects your aerobic and anaerobic energy systems as well as the following muscle groups: muscles of the chest, shoulder, triceps, quadriceps, abdominals, and lower back.

Event

For this event, the firefighter must crawl through a culvert that is 15' foot in length and 24" inches in diameter. Prior to entering culvert, you will doff your SCBA, but your face piece will remain on with regulator connected as you proceed through culvert. Upon exit from the culvert, don your SCBA, the event is concluded.

Walk 85' feet within the established walkway to the next event.

If for any reason, you choose to end the event, call out or rap sharply on the culvert and you will be assisted out.

Event 7: Rescue (on-air)

Equipment

This event utilizes a 180-pound approved fire service rescue mannequin.

Purpose of Evaluation

This event is designed to simulate the critical task of removing a victim or injured firefighter from harm. This event challenges your aerobic capacity, upper and lower body muscular strength and endurance, grip strength and endurance, and anaerobic endurance. This event affects your aerobic and anaerobic energy systems as well as the following muscle groups: quadriceps, hamstrings, glutes, abdominals, torso rotators, lower back stabilizers, trapezius, deltoids, latissimus dorsi, biceps, and muscles of the forearm and hand (grip).

Event

For this event, the firefighter is required to drag a 180-pound fire service rescue mannequin a total of 70' feet. Utilizing a piece of webbing, or the one rescuer incline drag, the firefighter shall drag the mannequin 35' feet to an object (barrel or traffic cone), make a 180 degree turn around the object, and continue an additional 35' feet to the finish line. You are not permitted to grasp or rest on the drum. It is permissible for the rescue mannequin to touch the drum. You are permitted to drop and release the mannequin and adjust your grip if needed. The full length of the rescue mannequin must cross the marked finish line.

This concludes the confidence course.