

BALTIMORE COUNTY FIRE DEPARTMENT

LINE OF DUTY DEATH INVESTIGATION REPORT



FIREFIGHTER GENE KIRCHNER

Reisterstown Volunteer Fire Company

INCIDENT LOCATION:

19 Hanover Road

Reisterstown, Maryland

April 24, 2013 at 0109 hours

REPORT PUBLISHED: April 21, 2014

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In the early hours of April 24, 2013, while most Baltimore County residents were asleep and safe in their homes, Firefighter Gene Kirchner of the Reisterstown Volunteer Fire Co. was on duty, ready to serve and protect his community. He was one of the first responders on the scene of a dwelling fire with people trapped at 19 Hanover Road in Reisterstown. A little more than a week later, Firefighter Kirchner succumbed to injuries sustained while trying to rescue the occupants from that dwelling fire.

The following report represents the Baltimore County Fire Department's diligent effort to discover the sequence of events that led to this tragedy. The goal, of course, is to learn from what happened and prevent such a terrible thing from ever happening again. This is how we ensure that Firefighter Kirchner's sacrifice is not in vain.

I never had the privilege of knowing Firefighter Gene Kirchner personally. Yet I know him as a symbol of the best the Baltimore County Fire Service has to offer. The Baltimore County Fire Department and the volunteer stations that comprise the Baltimore County Volunteer Firemen's Association are full of people like Gene: devoted, selfless people who try every day to help their fellow citizens. Sadly, their calling sometimes demands the supreme sacrifice.

Gene Kirchner was an exceptionally trained and experienced firefighter; he was grievously injured doing a job for which he had prepared. At the Hanover Road fire, he did what was expected of him; he tried to locate someone trapped and in need of help.

After reading this report and reflecting upon its contents – including the sequence of events – I am so very proud of Firefighter Kirchner and his heroic efforts. He spent the last moments of his life trying to make a difference in our world.

Of course, we also are incredibly saddened as we review the events of April 24, 2013. Firefighter Kirchner was known and loved by so many at RVFC and in the Reisterstown community. He was a model employee who juggled a regular job while also serving his community. I am deeply touched by his character, his reputation for excellence, his hopes and dreams. It is a tragedy that we will never know how he might have fulfilled his potential.

I am deeply moved by the response of Firefighter Kirchner's family over the past months. They have handled this tragedy with poise, dignity and strength. In so doing, they already continue the propensity for caring that was a part of Gene's character. Gene did what he loved and knew what he was doing; his decision to risk all for others was a conscious one.

I want to thank the BCoFD Investigation Committee for its diligent efforts and its devotion to finding the facts and making recommendations. Committee members had to wade through volumes of data and reports and conduct many interviews, often emotionally charged. Their contribution is commendable, and their final report stands as a tribute to Gene's service and sacrifice.

I thank the leadership and members of the Reisterstown Volunteer Fire Co. for their guidance and assistance in compiling this report. Your posthumous tributes to Gene have moved us and honor your company's outstanding legacy.

Finally, let me say that there is no monument, no medal and no ceremony that can honor Firefighter Gene Kirchner as much as our decision to emulate his commitment to public service. Each of us owes it to him to do this. This is the way we pay tribute to our heroes.

John J. Hohman
Fire Chief

Executive Summary

On Wednesday, April 24, 2013 at 01:09:04 hours a dwelling fire with people trapped was dispatched to 19 Hanover Road, 0.32 miles from the Reisterstown Volunteer Fire Company.

A Baltimore County Police officer (Car 326) arrived at 01:11:58 hours and advised that two subjects were still inside and there was “thick smoke from the front of the location.” At 01:13:52 hours Special Unit 418 (SU 418) from Reisterstown Volunteer Fire Company was first to arrive with two firefighters (including Firefighter Kirchner) and reported “smoke showing.” They donned their protective clothing and SCBA and conducted reconnaissance of the situation. Engine 56 from the Franklin Fire Station arrived approximately two minutes after SU 418, conducted a 360° survey and delivered a Brief Initial Report, “Engine 56 arrived, 2 ½ story wood frame...got heavy smoke showing...we have a hydrant behind Engine 56. Captain Engine 56 has [command].” At 01:17:36 hours, Engine 56 updated his report, “Dispatch from Command, go ahead and start me a 2nd alarm...I’ve got heavy fire...on side Charlie.”

Two firefighters from Engine 56 advanced a 1-3/4" pre-connected hand line to the front of the building while the Fire Apparatus Driver/Operator of Engine 56, assisted by the Engine 412 driver connected a supply line to the hydrant. As the firefighters from Engine 56 were preparing to enter the front door, Firefighter Kirchner (SU 418) approached them on the front porch and reported a person trapped on the second floor. Firefighter Kirchner entered the dwelling ahead of the crew from Engine 56, as they advanced the hose line to the second floor. He and his partner from SU 418 began searching for the victim on the second floor.

The firefighters from Engine 56 reported zero visibility with heavy smoke and high heat conditions at the top of the stairs of the second floor. Minutes later, the nozzle firefighter reports hearing a PASS device sounding. Unable to locate the source of the alarm, Engine 56 nozzle firefighter declares a MAYDAY.

Engine 56 back-up firefighter discovers Firefighter Kirchner in a bedroom lying face down between the door and the bed. When Firefighter Kirchner is found, he is not wearing his facepiece, his hood, or his helmet. They are unsure if he is wearing his gloves as they start the process of dragging him from the room. Crews drag Firefighter Kirchner down the steps head first on his back and remove him to the front porch. Firefighter Kirchner is unconscious, is not breathing, and has no pulse. Medic 56 with EMS 5 transports him to Northwest Hospital Center where he is initially treated. Firefighter Kirchner was then transferred by IV 415 with Medic 56's crew and Doctor David Vitberg on board (Dr. Vitberg is an Associate Medical Director for the Baltimore County Fire Department) to the R Adams Cowley Shock Trauma Center at the University of Maryland Medical Center in Baltimore. Firefighter Kirchner dies of his injuries on May 2, 2013 at 1147 hours.

One civilian victim died in the fire. He was found in the second floor hallway, near the bottom of the steps leading to the attic.

Consolidated List of Recommendations

1. Company officers shall ensure that crew integrity is maintained at all times by all personnel operating in an Immediately Dangerous to Life or Health (IDLH) environment. Crews should work in pairs when practical.
2. No personnel shall operate in an IDLH environment without a portable radio.
3. Crews should frequently drill using the procedures for initiating a MAYDAY as stipulated in SOP Tactical 09.
4. Incident commanders must understand that an early initial 360° gives them the information needed to develop effective strategy and tactics for incident mitigation.
5. The Rapid Intervention Team is a vitally important part of the Incident Command System.
6. Personnel should use caution when passing a hydrant that is in their direction of travel and close to the fire building.
7. Personnel should be prepared for unexpected building construction and occupancy features that are not readily visible that can affect fire dynamics.
8. When indicated, officers and crews should embrace the concept of transitional fire attack and ventilation coordinated with fire attack.
9. Frequent updates from Dispatch help crews prepare for strategy and tactical decisions upon arrival.
10. Control of incident communications is an effective aid to clear command and control.
11. When units arrive at the scene, they should immediately call “arrived” so that a proper sequence of events time-stamp occurs.
12. Personnel must fully don SCBA before entering an IDLH environment.
13. The ability to buddy breath and diagnose SCBA difficulties in an IDHL environment are critical skills for survival that require constant training to ensure proficiency.
14. As most personal protective equipment (PPE) is issued to and under the custody of individual personnel, it is imperative that personnel regularly inspect this PPE.

Note: Full explanations, analysis, and discussion of the recommendations are on page 54, Conclusions and Recommendations.

Introduction and Investigation Process

The Baltimore County Fire Department Standard Operating Procedures Personnel #16- Line of Duty Death/Life Threatening Injury and Funeral Policy, provides guidance for the investigation of significant events. An investigation committee was assembled by Fire Chief John J. Hohman and consisted of Assistant Fire Chief Mark F. Hubbard, Battalion Fire Chief Francis DiPaula, Fire Director Charles Rogers, Fire Captain Thomas Ramey and Glenn Resnick, Senior Vice President of the Baltimore County Volunteer Firemen's Association.

Representatives of the Reisterstown Volunteer Fire Company were invited to participate in meetings and included Chief Robert Murray, Sr. (retired Fire Captain, Baltimore County Fire Department), and Brian Quick, Treasurer.

The committee met several times to collect and review documentary evidence of incident operations, equipment tests, training records, and standard operating procedures. Subcommittees were formed and individual members were commissioned for certain follow-up interviews, site visits, and data collection. Facts were obtained by photographs of the scene, interviews of participants including fire suppression crews, emergency medical services crews, police officers, fire investigators, and medical care providers at the hospitals. The committee also reviewed the fire incident reports, medical reports, and the report of the Maryland Office of the Chief Medical Examiner. The committee thanks Dr. Vitberg, an Associate Medical Director for the Baltimore County Fire Department, for his assistance reviewing medical reports.

The cause and origin of the fire was investigated by the Baltimore County Police Department Arson Unit. The committee wishes to thank them for their assistance with documenting the scene and for collecting and preserving evidence. The cause was determined to be "undetermined" and the point of origin was determined to be the kitchen on the first floor of the home. Their report is available for review upon request to the Baltimore County Police Department as CC# 131140107.

The committee confined the scope of the investigation to the series of events leading to the fatal injury and concluded with Firefighter Kirchner's removal from the building. After the MAYDAY operations concluded, the incident proceeded as a routine dwelling fire with one civilian fatality.

The committee shared and exchanged information with the investigative team from the National Institute for Occupational Safety and Health (NIOSH).

Biography of Firefighter Gene Kirchner



Gene Meir Kirchner was born on August 22, 1987 in Israel. He moved to Maryland in 1988, when he was 15 months old. Gene grew up in Howard and Baltimore Counties, attending Waverly Elementary and Franklin Middle School. As a child, Gene was an avid swimmer and soccer player. He graduated as an honor roll student from Owings Mills High School in 2006, participating in track and field, cross country, and band. Gene continued his education at the University of Advancing Technology in Phoenix, Arizona, where he studied computer information systems.

Gene joined the Reisterstown Volunteer Fire Company as a junior firefighter when he was 16 years old, following in the footsteps of his twin brother Will and sister Shelly. During his nine year tenure, he completed certification as a firefighter, Emergency Medical Technician, IV Technician, Rescue Technician,

along with many others. He devoted his time to serving his community and had responded to over 3,000 emergencies in his tenure, achieving status as a top responder in each year of service, for both EMS and fire suppression. Gene's passion was helping others, demonstrated by the enjoyment he got giving fire prevention lessons to local daycare centers and schools. A task he undertook often and without fanfare.

Gene was employed by Butler Medical as an EMT and dispatcher. He was enrolled in a class to become a Paramedic and had career goals of becoming a Baltimore County Fire Department Paramedic.

Gene was a devoted public servant, but was also a devoted son, brother, uncle, nephew, cousin, and friend. Family was of great importance to Gene, as were his friends. He had a broad smile and giving heart. He was selfless, dedicated, and loyal in all facets of his life.

Gene died in the line of duty as a result of injuries sustained while attempting to rescue a man from his burning home, during a multi-alarm fire on April 24, 2013 in the Reisterstown area. He died on May 2, 2013 at the age of 25. He is survived by his parents Paulette Ohana and Gene Kirchner, sisters April Lichtenberg and Shelly Brezicki, and twin brother Will Kirchner.

Department Overview and Staffing

Baltimore County Fire Service Overview

The Baltimore County Fire Department provides fire protection, emergency medical and emergency rescue to the county's 800,000 citizens.

<http://www.baltimorecountymd.gov/Agencies/fire/index.html>

Baltimore County covers an area of 610 square miles. Located in central Maryland, it surrounds the city of Baltimore on three sides and extends from the Chesapeake Bay in the southeast to Pennsylvania in the north. The Fire Department serves a diverse area, including heavy industrial areas, small towns, suburban neighborhoods and farmland. The northern two-thirds of the county is almost exclusively rural, with denser suburban populations and industrial areas located, east to west, in a horseshoe surrounding Baltimore City.

Mission

The mission of the Baltimore County Fire Department is to provide the highest quality fire protection, emergency medical services, fire prevention, safety education, community services and mitigation of emergency and non-emergency incidents to the citizens of and visitors to Baltimore County.

Our service delivery is enhanced through training, education, planning and teamwork. We will achieve our mission safely while remaining economically responsible through the effective and efficient use of all resources.

Personnel and Equipment

The department includes more than 1,000 paid emergency response personnel, assigned to 25 [career stations](#). These career responders work at fire and rescue scenes alongside volunteer firefighters from the county's 33 [volunteer fire companies](#). More than 2,000 citizens volunteer in the fire service as active responders, fundraisers and support personnel. Though volunteer companies are independent, private corporations, Baltimore County has a true joint fire service, with dedicated career and volunteer responders working together at emergency scenes every day on behalf of our citizens.

Baltimore County Volunteer Firemen's Association: <http://www.bcvfa.org/>

Reisterstown Volunteer Fire Company: <http://rvfc.org/>

Baltimore County firefighters and emergency medical technicians respond to more than 114,000 incidents annually. More than 70 percent of those incidents are medical calls.

Apparatus available to serve county citizens include:

- 88 engines (27 career and 61 volunteer)
- 13 trucks (7 career, 6 volunteer)
- 3 tower ladders
- A state-of-the-art, urban search-and-rescue unit
- A decontamination unit
- Six large-capacity tankers for rural firefighting
- Various brush and squad units

Ten career engine companies have advanced life support capabilities; these are strategically located throughout the county. Volunteer companies operate the county's nine heavy rescue squads.

Special Operations

An Advanced Tactical Rescue team (ATR), housed at the Texas Fire Station, is specially trained for unusually difficult, complex rescues, such as building collapses, water rescues, trench rescues and high-rise rescues. The ATR team was dispatched to New York by the federal government on Sept. 11, 2001 to assist with rescue and recovery following the terrorist attacks.

A state-of-the-art urban search-and-rescue vehicle is equipped to handle building collapses, water rescues, trench rescues and other tactical emergencies. The unit was purchased with federal homeland security funds and is available for deployment throughout the region.

Besides the ATR squad, the County has swift-water teams at two volunteer companies, Kingsville and Arbutus. The Middle River Volunteer Ambulance Rescue has a Dive Rescue Team, and the Bowleys Quarters Volunteer Fire Dept. has a Marine Emergency Team used for open water rescues on the Chesapeake Bay, lakes and reservoirs.

The Department operates a hazardous materials unit, stationed centrally at the Brooklandville Fire Station, and Hazmat satellite units.

Two volunteer coffee wagons provide invaluable support by supplying food and drink and other services to firefighters and emergency medical personnel at the scenes of fires and various emergencies. Volunteer members of Box 234 Association, Inc. (Company 156), and the Central Alarmers (Company 155), make themselves available at any hour of the day or night. The coffee wagons also routinely provide support at Fire Department events such as dedications, ceremonies, and press conferences.

Emergency Medical Services

More than 70 percent of all calls received by the Fire Department are medical calls.

Medic units are housed in fire stations alongside fire apparatus, and many career and volunteer personnel are trained in



both EMS and fire suppression. The department operates 46 advanced life support medic units, 29 career and 17 volunteer.

Residents of Baltimore County enjoy a state-of-the-art emergency medical and trauma care system. This system features:

- Advanced life support engine companies
- Emergency medical technicians and paramedics on all medic units
- Maryland State Police Medevac helicopters
- The world-renowned Shock Trauma Center at University of Maryland Hospital

Training

The Baltimore County [Fire-Rescue Academy](#) provides year-round training and certification maintenance for career and volunteer personnel. The Academy has 11 full-time career instructors, augmented by career and volunteer adjunct instructors.

Communications

Communications for the Baltimore County Fire Department are handled by an 800 MHz voice and data communications system. All emergency apparatus is equipped with mobile radios; medic units are also equipped with mobile data terminals allowing voice and data communications while en route to an emergency scene. In addition, crews are equipped with portable radios to aid personnel safety and emergency scene communications.

The dispatching center, centrally located in Towson, is a combination center providing service for Police, Fire, EMS and 911 emergency calls. It is a 24-hours-a-day operation managed by 31 civilian emergency communications technicians. A network of eight radio towers positioned strategically throughout the county ensures complete radio coverage for Baltimore County.

Support Services

The Baltimore County Fire Department supports its emergency operations with an extensive network of services including:

- [Fire code enforcement](#)
- Fire inspections
- [Community safety education](#)
- Public information services
- Breathing apparatus maintenance
- Information technology
- Fire communications
- Recruitment
- Supply/equipment maintenance

Career Staffing

The Baltimore County Administration and the Baltimore County Professional Fire Fighters Association have a Memorandum of Understanding, which includes a Minimum Staffing Provision. (MOU excerpt- Article 13, Section 13.4)

The County agrees not to utilize volunteer personnel to fill any of the below listed positions, except in cases of extreme emergency. Effective July 1, 2009, a minimum of one hundred ninety-one (191) employees shall be scheduled and working at all times. To ensure safety, engines and trucks shall be staffed with a minimum of four personnel, one of whom must be an officer. Medic units shall be staffed with a minimum of two personnel.

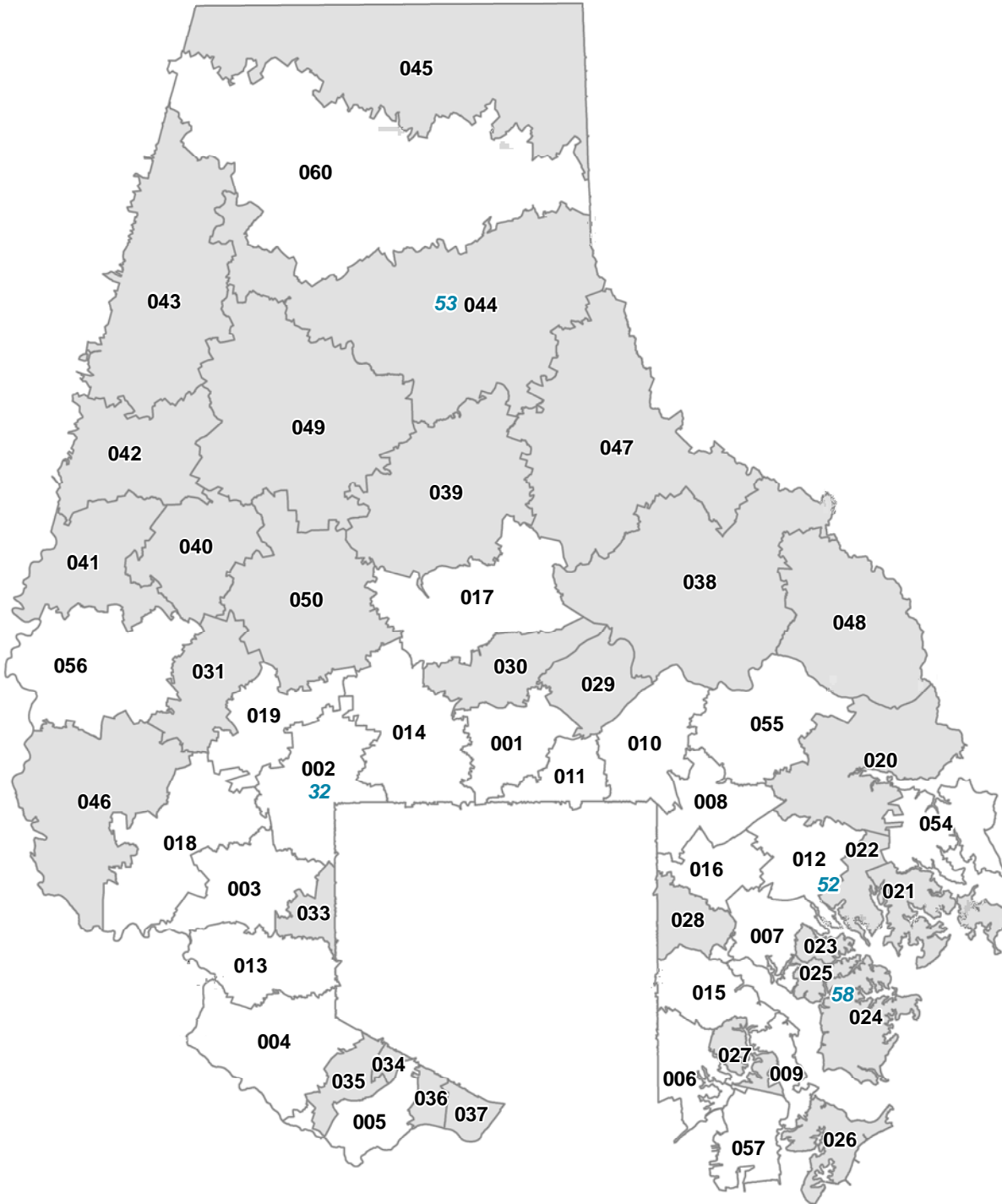
If a vacancy occurs due to sick, vacation, bereavement or other types of leave, callbacks are made to backfill those positions.

Volunteer Staffing

The Baltimore County Fire Department has a minimum staffing requirement for apparatus responding to structure fires of four personnel on engines and trucks; therefore, each of the 33 volunteer companies must comply with the staffing levels required for the specific incident, otherwise, the next unit assigned to the incident is also alerted.

Baltimore County Fire Department

Career & Volunteer Fire Station Locations



STA	NAME
1	Towson
2	Pikesville
3	Woodlawn
4	Catonsville
5	Halethorpe
6	Dundalk
7	Essex
8	Fullerton
9	Edgemere
10	Parkville
11	Hillendale
12	Middle River
13	Westview
14	Brooklandville
15	Eastview
16	Golden Ring
17	Texas
18	Randallstown
19	Garrison
20	White Marsh VFC
21	Bowleys Quarters VFD
22	Middle River VFC
23	Middleborough VFD
24	Rockaway Beach VFC
25	Hyde Park VFD
26	North Point/Edgemere VFD
27	Wise Avenue VFC
28	Rosedale VFC
29	Providence VFC
30	Lutherville VFC
31	Owings Mills VFC
32	Pikesville VFC
33	Woodlawn VFC
34	Violetville VFD
35	Arbutus VFD
36	Lansdowne VFD
37	English Consul VFD
38	Long Green VFC
39	Cockeysville VFC
40	Glyndon VFD
41	Reisterstown VFC
42	Boring VFC
43	Arcadia VFC
44	Hereford VFC
45	Maryland Line VFC
46	Liberty Road VFC
47	Jacksonville VFC
48	Kingsville VFC
49	Butler VFC
50	Chestnut Ridge VFC
52	Middle River Vol Ambo
53	Hereford VFC Ambo
54	Chase
55	Perry Hall
56	Franklin
57	Sparrows Point
58	Back River Neck Vol Ambo
60	Parkton

CAREER
 VOLUNTEER

Weather Conditions and Building Construction

According to data from the U.S Department of Commerce - National Oceanic and Atmospheric Administration, on April 24 at Baltimore Washington International Airport, the sky conditions were “clear” with eight mile visibility. The temperature was 45° F and 7.2° C. Dew point was 42° F and 5.6° C. Relative humidity was 89% and the wind speed was 0 mph. Barometric pressure was 29.94.

Building Construction, Features and Occupancy – Single Family Dwelling

The building, #19 Hanover Road is a 2 ½ story balloon frame constructed dwelling, brick exterior, with below grade basement. Bedrooms were on the second floor with two small bedrooms in an attic space. It is situated on a .5 acre lot with 3032 square feet of interior space. The Maryland Department of Assessments and Taxation, Real Property Data Search indicates the property use is “commercial.” The investigation revealed several occupants with some space used for artist studios.

A unique feature is that stairs rise to the second floor from a few feet inside the dwelling and terminate at a landing on the second floor. A second set of stairs rise parallel, from a side room on the first floor (typically known as “servant stairs”) and penetrate the second floor a few feet in front of the main stairs. This fact would lead to confusion about the exact location of the fire because it introduced unexpected smoke and heat to the second floor hallway.

Smoke detectors were noted; however, it is unknown if they were operational at the time of the fire.

Topography

From side Alpha the building has 2 ½ stories above grade. The first floor of the building is entered in the center of the building under a covered awning-style porch that extends the width of the structure. Trees obstruct a clear view of the home from the street. A driveway travels from the street along side Bravo and terminates in a parking pad to side Charlie. A hedgerow separates the property from adjacent structures.

Roof

The roof is pitched, constructed of 2x10 wood rafters attached to a ridgepole. The roof covering is sheet metal with wood decking. There is a dormer on the Alpha side of the dwelling.

Floor and Ceiling

The floor assembly consists of 2x10 inch floor wood joists covered by plywood with hardwood floor throughout. The wood joists run from the Alpha to Charlie side. The ceilings in the building are plaster over backer board throughout.

Walls

The house has balloon frame construction, 2x4 wood studs in the walls with no fire stops from the foundation sill to the attic. The interior walls are covered with backer board and plaster. Due to remodeling over the years, there are also some interior walls in the structure that are 2x4 wood studs with drywall. Exterior walls are constructed of 2x4 wood covered with brick and sand lime mortar. There is a wood frame addition on the first and second floors on Charlie side and first floor on the Delta side.



side Alpha



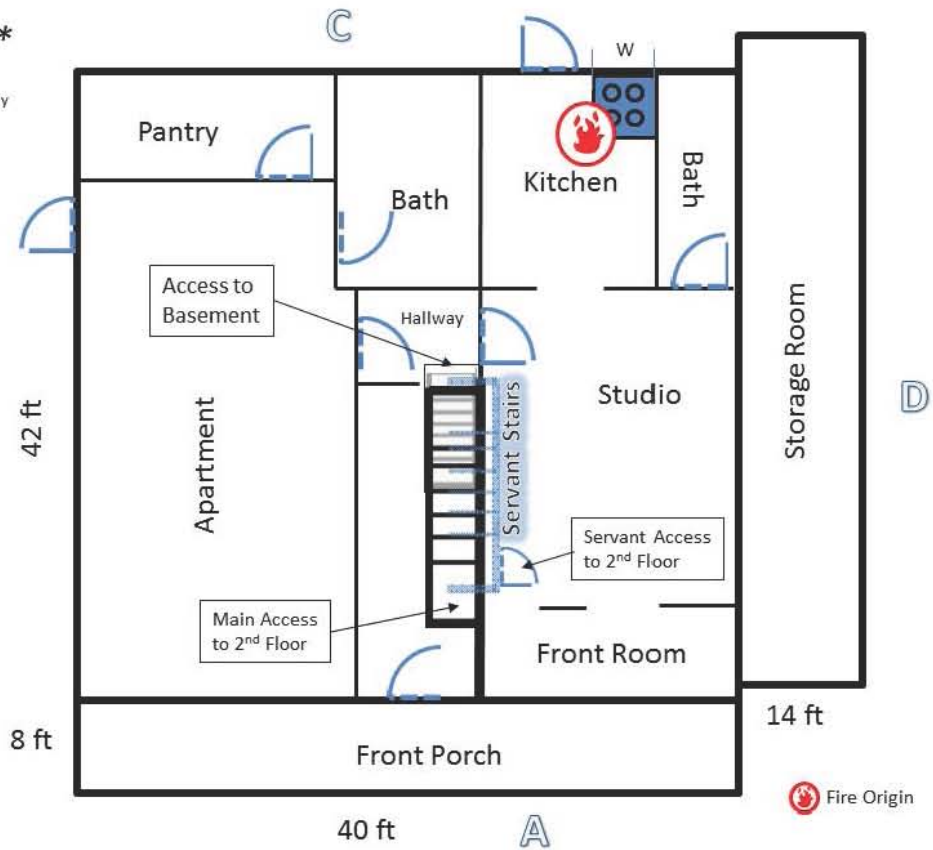
side Charlie



Aerial View

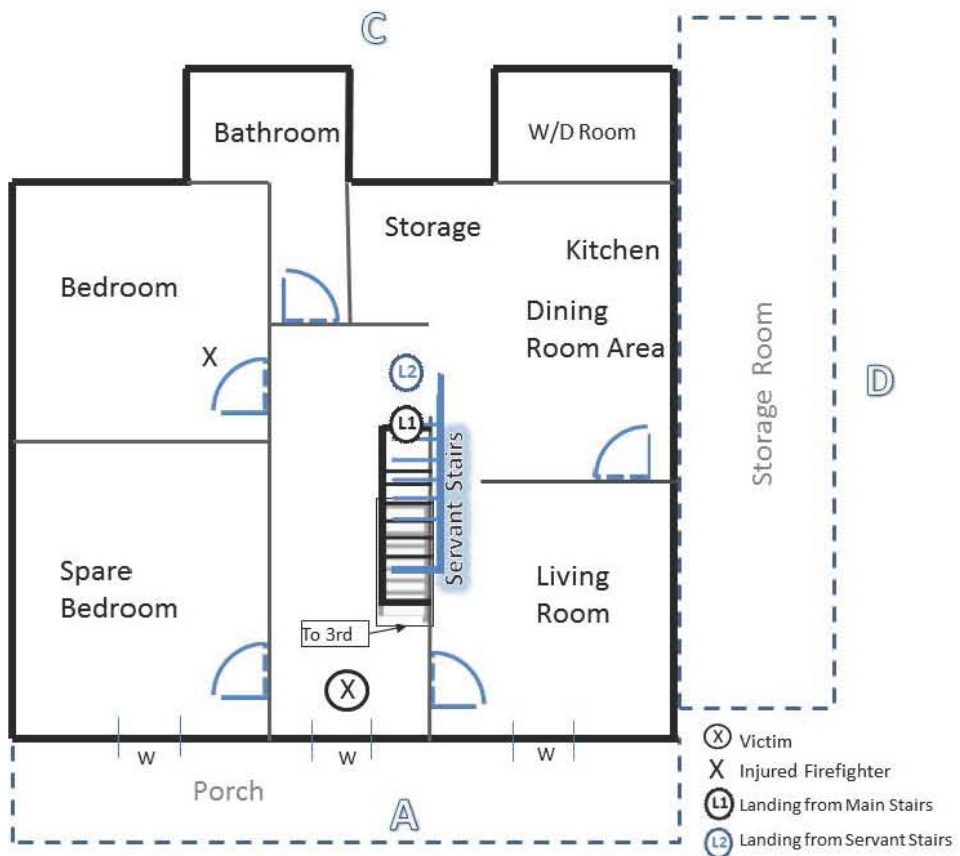
1st Floor*

*Floor plan and sizing approximately



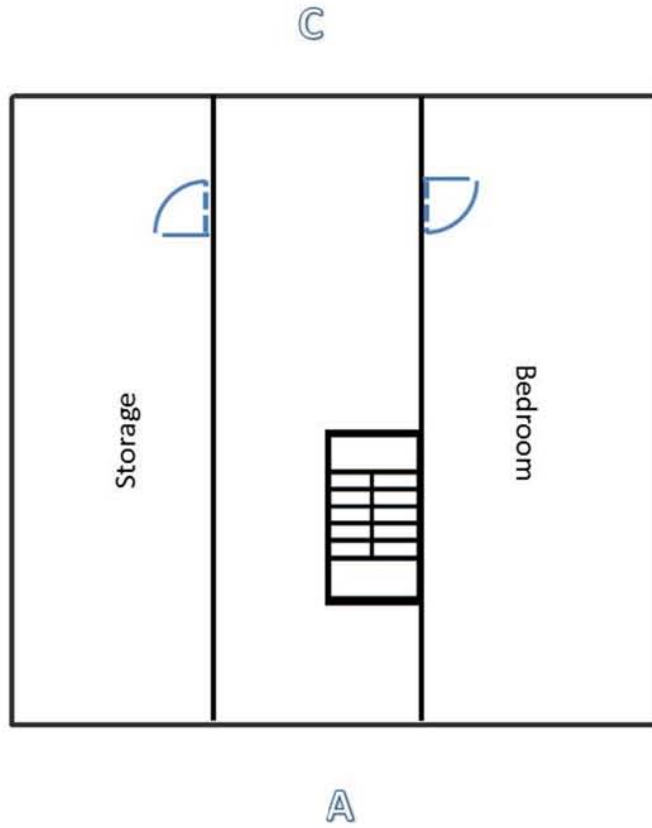
2nd Floor*

*Floor plan and sizing approximately



3rd Floor*

*Floor plan and
sizing approximately



Sequence of Events

(The following is based upon information gathered by interviews with participants, the report by the Baltimore County Police Department Arson Unit, and dispatch recordings and transcripts.)

The incident was dispatched by the Fire Dispatch Talkgroup-Main 1 operator at 01:09:04 hours, Wednesday, April 24, 2013 as: “Fire-Rescue Box 41-20, 15 Hanover Road, Battalion Chief 22, Operations on TAC 22, Engine 412, Engine 401, Engine 56, Engine 311, Truck 404, Squad 414, Medic 56 and EMS 5 (Squad 322 at 01:10:05) for the dwelling with people reported trapped, cross streets of Reisterstown Road and West Gate Road.” At 01:10:23 hours, police dispatch notified police officers responding that this was a “house that was made up of apartments. There is a male on the 3rd floor...They’re banging on the front door, they have people screaming inside, they don’t know if they’ve gotten everybody out.”

The dwelling is 0.32 miles from the Reisterstown Volunteer Fire Company station. Throughout the response, additional information was received indicating that people were trapped on the second floor. Callers also stated the fire was on the first and second floors. One of the occupants reports speaking to the trapped victim trying to direct him to the staircase to escape from his third floor attic bedroom. This victim ultimately succumbed to his injury and was found in the second floor hallway, near the bottom of the steps leading to the attic. He was in front of a window on side Alpha. Outside this window is the roof over the covered front porch.

A Baltimore County police officer (Car 326) arrived at 01:11:58 hours and advised that two subjects were still inside and there was “thick smoke from the front of the location.” At this point, EMS 5 (still en route) requested two additional medic units.

At 01:13:52 hours Special Unit 418 (SU 418) from the Reisterstown Volunteer Fire Company was first to arrive with two firefighters (including Firefighter Kirchner) and reported “smoke showing.” (Note - this is the first and only transmission from SU 418 per audio records.) While donning their gear, the crew from SU 418 spoke with police officers to receive information gathered thus far. They donned their protective clothing and SCBA and conducted reconnaissance of the situation. The crew from SU 418 then attempted to locate the seat of the fire and the last known location of trapped occupants based upon on-scene face-to-face reports of other occupants who escaped prior to their arrival.

Engine 56 from the Franklin Fire Station calls “arrived” at 01:16:07 hours but it was noted through interviews that Engine 56 arrived approximately two minutes after SU 418 but did not announce their arrival until the Captain had a moment to prepare his Brief Initial Report (BIR) and determine the proper building involved due to heavy smoke conditions. The Captain conducted a 360° survey and delivered a BIR, “Engine 56 arrived, 2 ½ story wood frame...got heavy smoke showing...we have a hydrant behind Engine 56. Captain Engine 56 has [command].”

Engine 412 from the Reisterstown Volunteer Fire Company called arrived at 01:15:02 hours but, per interviews they actually arrived after Engine 56 was on the scene. Engine 412’s crew was directed immediately to bring a line to side Charlie to attack from the exterior on the first floor. In the interviews it was noted that two, 1 ¾" hand lines were deployed on side Charlie and two, 1 ¾" hand lines were deployed on side Alpha to support the extinguishment of the fire.

Several pieces of equipment from the first alarm assignment arrived on location. Medic 56 from the Franklin Fire Station arrived at 01:16:34 hours, followed by Truck 404 from Glyndon Volunteer Fire Department at 01:16:46

hours. The Truck was directed to place ladders and ventilate the second story windows. EMS 5 arrived at 01:16:54 hours and immediately established “Medical” at the Royal Farm Store parking lot located approximately 50 feet from the dwelling. Engine 312 from Owings Mills Volunteer Fire Company arrived at 01:17:08 hours. At 01:17:36, Engine 56 updated his report, “Dispatch from Command, go ahead and start me a second alarm...I’ve got heavy fire...on side Charlie.”

Two firefighters from Engine 56 advanced a 1-3/4" pre-connected hand line to the front of the building while the Fire Apparatus Driver/Operator (FADO) of Engine 56, assisted by the Engine 412 driver, connected a supply line to the hydrant. A police officer approached the hand line crew and reported fire coming from the rear of the house.

As the firefighters from Engine 56 were preparing to enter the front door, Firefighter Kirchner (SU 418) approached them on the front porch and reported a person trapped on the second floor. The firefighter from Engine 56 reported that Firefighter Kirchner was wearing his SCBA face piece but is unsure if he was connected to his regulator. Firefighter Kirchner entered the dwelling ahead of the crew from Engine 56, as they advanced the hose line to the second floor. The hallway for the first floor rooms was impassable due to stacked furniture and other belongings. Per the nozzle firefighter of Engine 56, visibility was initially good on the first floor. Firefighter Kirchner and his partner from SU 418 began searching for the victim on the second floor. Firefighter Kirchner’s partner reports there was a lot of clutter on the second floor requiring him to move and relocate items in the hallway to make a path forward during the search for the civilian victim.

The firefighters from Engine 56 reported zero visibility with heavy smoke and high heat conditions at the top of the stairs of the second floor. The nozzle firefighter reported, “hearing the fire.” This caused him to spray the

ceiling for a few seconds in an attempt to reduce the heat. Feeling his arms begin to burn, he backed down a few steps. At 01:20:25, Engine 56 nozzle firefighter requested that command find another route of access to the fire in the first floor reporting, “we’re trying to make the second floor now, we have heavy heat up here.”

At 01:20:44 hours Command reported they were searching for a middle-aged man last seen by the stairwell on the second floor. The Engine 56 nozzle firefighter then requested another crew upstairs with the thermal imaging camera to assist with the search. At 01:21:14 hours, Engine 56 nozzle requested that the windows be “opened up.”

Engine 19 from Garrison Fire Station arrives at 01:22:21 hours and assumed the function of the Rapid Intervention Team (RIT). At 01:22:49 hours, Engine 412 notifies Command that they have one civilian who is being treated by a medic crew and informs Command that they may need additional medic units dispatched. The firefighters from Engine 56 made a second attempt to enter the second floor hallway encountering more cluttered items somewhat inhibiting their path.

Per the crew’s statement, the nozzle firefighter reports hearing a Personal Alert Safety System (PASS) device sounding. He then verbally calls out and tries to identify the source. At 01:23:30 hours, the nozzle firefighter from the crew of Engine 56 makes this transmission, “56 nozzle to the crew from 41,” but there is no reply. This is where we first hear the PASS device shrill tone in the background of the radio transmissions.

At 01:24:32, Command requests an updated status from the interior. At 01:24:37 hours, Engine 56 nozzle firefighter replies, “We’re trying to push the second floor but we got heavy heat, we gotta get that...windows vented from the second floor by the truck crew.” A PASS device can be heard sounding in

the background. This is about the time that Battalion Chief 22 arrives at location at 01:23:44 hours. Seconds later at 01:24:51 hours, Engine 56 nozzle firefighter declares a MAYDAY.

The Talkgroup 22 operator sounds the alert, 3 tones, at 01:24:56 hours and attempts to ascertain the source of the MAYDAY. Dispatch now announces, “Engine 56 portable 3 receiving a MAYDAY from Engine 56 portable 4. This talkgroup is now restricted. Engine 56 portable 4, what is your location? (They are walked on by Engine 56 portable.)

During this time period, the back-up firefighter from Engine 56 and the other crew member from SU418 are individually actively searching for the PASS sound source. Engine 56 back-up firefighter continued his search towards the sound of the PASS device which led him to the bedroom that was at the top of the steps a few feet across from the two stairwells. He had difficulty entering the room so he had to force himself into the room by pushing against the door to open it enough to enter. When Engine 56 back-up firefighter enters the room he comes face-to-face with the second firefighter from SU 418 who points down to the floor where Firefighter Kirchner is laying. Engine 56 back-up firefighter discovers Firefighter Kirchner lying face down between the door and the bed. When Firefighter Kirchner is found, he is not wearing his face piece, his hood, or his helmet. They are unsure if he is wearing his gloves as they start the process of dragging him from the room.

At 01:25:28 hours, Engine 56 nozzle firefighter answers “second floor attack Engine 56, we believe we got somebody from 41 down....PASS alarm is going off.” Engine 56 at 01:25:38 hours says, “Jeff, he’s with you... is the MAYDAY with you?” At 01:25:44 hours, Engine 56 nozzle firefighter responds, “Negative, we’re trying to locate on the second floor.” Approximately one minute later at 01:26:58 hours, Engine 56 portable announces “Engine 56 portable, we’re coming down the stairs.” There is still the sound of a PASS alert heard in the background of this transmission.

At this point, the two firefighters from Engine 56, and the second crew member from SU 418 drag Firefighter Kirchner down the steps head first on his back. They are met at some point by the Rapid Intervention Team of Engine 19 and complete the process of removing him from the building to the front porch; the exact time of his arrival on the porch is not confirmed.

Once on the porch, at 01:28:05 hours, they are met by Battalion Chief 22 and the EMS crews. SCBA air flow was heard by the Captain from Engine 19 who attempted to turn Firefighter Kirchner's air bottle off, but he reports in his interview that he discovers the bottle was already in the off position. He then discovered that the air flowing he heard was from Engine 56 back-up firefighter's breathing apparatus.

Firefighter Kirchner's PASS device was still alarming when they exited the building. When his breathing apparatus was removed, it was secured by police and the PASS alarm was turned off by Engine 56's FADO. In his interview, he stated that he had to bleed the bottle down to turn off his PASS device, releasing the air pressure in the hose between the bottle and the PASS device.

Firefighter Kirchner is unconscious, is not breathing, and has no pulse. His turnout gear is cut away and they begin resuscitative efforts. Medic 56, with EMS 5, departs at 01:34:11 hours for Northwest Hospital Center and arrives at 0146 hours, where Firefighter Kirchner is initially treated. Firefighter Kirchner was then transferred by IV 415 with Medic 56's crew and Dr. David Vitberg on board. (Dr. Vitberg is an Associate Medical Director for the Baltimore County Fire Department.) They depart at 02:12:30 hours for the R Adams Cowley Shock Trauma Center at the University of Maryland Medical Center in Baltimore and arrive at 2:26:50 hours.

Firefighter Kirchner dies of his injuries on May 2, 2013 at 1147 hours.

Dispatch Audio Transcripts

Original Dispatch Information on Talkgroup- Main 1

1:09:04 AM	MAIN	Fire Rescue Box 41-20.....15 Hanover Rd.
1:09:46 AM	MAIN	Alert Fire Rescue Box 41-20, Battalion 22, Operations on TAC 2-2 Engine 412, Engine 401, Engine 56, Engine 311.....Truck 404, Squad 414, Medic 56, EMS 5.

TALK GROUP TAC 2-2

TIME	TRANSMITTER	RADIO TRANSMISSION
1:10:37 AM	BC22	Battalion 22's en route
1:10:40 AM	TAC 2-2 (dispatcher)	Battalion Chief 22 0110
1:11:00 AM	EMS 5	EMS 5 en route
1:11:02 AM	TAC 2-2	EMS 5 0111
1:11:04 AM	E56	Engine 56 en route
1:11:07 AM	TAC 2-2	Engine 56 0111 (Cross Traffic E312)
1:11:10 AM	TAC 2-2	Engine 312 0111

1:11:28 AM	TAC 2-2	Battalion Chief 22 from Dispatch
1:11:33 AM	BC22	Go Ahead
1:11:36 AM	TAC 2-2	Ok the caller advised that there are sev...several people trying to still get out of the house people are trying to bang on door trying to get in to get 'em out, they're stuck on the 3rd floor, the fire's on the 1st and 2nd floor
1:11:54 AM	BC22	Ok
1:12:06 AM	M56	Paramedic 56 en route
1:12:08 AM	TAC 2-2	Medic 56 0112
1:12:15 AM	TAC 2-2	Engine 412, Engine 401, Truck 404, Squad 414, Squad 322 response check 0112
1:12:24 AM	S322	En route
1:12:27 AM	TAC 2-2	Squad 322, 0112
1:12:30 AM	TAC 2-2	Battalion Chief 22 from Dispatch (Walked on by 2243204)(SU418-M)
1:12:35 AM	BC22	Go Ahead
1:12:37 AM	TAC 2-2	Police Car 326 is on location, advise 2 subjects still inside, smoke in thick from the front of location
1:12:48 AM	BC22	All right go ahead back up everything uh...that's uh...not called out yet

1:13:13 AM	EMS 5	Dispatch from EMS 5, Two more medic units
1:13:17 AM	TAC 2-2	EMS 5 requesting 2 additional medic units, 0113
1:13:35 AM	T404	Truck 4 zero 4 en route
1:13:38 AM	TAC 2-2	Truck 404, 0113
1:13:52 AM	SU418	Special Unit 418 arrived I've got smoke showing (Note- this is the first and only transmission from SU 418)
1:13:56 AM	TAC 2-2	Special Unit 418 with smoke showing 0113
1:14:29 AM	E19	Engine 19 en route
1:14:32 AM	E412	Engine.....(Apparently from E412)
1:14:37 AM	TAC 2-2	Engine 412 I have you en route, two people trapped on the 3rd floor 0114 (Walked on apparently by T18)
1:14:45 AM	M19	Medic 19 en route
1:14:47 AM	TAC 2-2	Medic 19, Truck 18, 0114
1:15:02 AM	E412	Engine 412 arrived
1:15:04 AM	TAC 2-2	Engine 412 arrived, 0115 (Note-Interviews reveal that Engine 56 arrives before Engine 412 but does not announce their arrival until the Captain has a moment to prepare a Brief Initial Report)
1:15:52 AM	2243167	412 I've got the line and bringing it to you (E412-M)

1:15:57 AM	TAC 2-2	Truck 18 from Dispatch you can clear
1:16:07 AM	E56	Engine 56 arrived, 2 1/2 story wood frame....got heavy smoke showing.....we have a hydrant behind Engine 56
1:16:18 AM	E56	Captain Engine 56 has.....
1:16:21 AM	TAC 2-2	Engine 56 with Command, smoke showing, 0116
1:16:26 AM	M2	Paramedic 2 en route
1:16:31 AM	TAC 2-2	Medic 2, 01.....
1:16:34 AM	M56	Medic 56 arrived
1:16:36 AM	TAC 2-2	Medic 56, 0116, Truck 18 from Dispatch you can clear
1:16:42 AM	T18	We're clear
1:16:46 AM	T404	Truck 4 zero 4 location
1:16:49 AM	TAC 2-2	Truck 404, 0116
1:16:54 AM	EMS 5	EMS 5 arrived I'll have Medical Command, we're gonna set the medic units up in the Royal Farms
1:17:02 AM	TAC 2-2	EMS 5 Medical Command, setting up Medical at Royal Farms, 0117
1:17:08 AM	E312	Engine 312 Arrived

1:17:13 AM	TAC 2-2	Engine 312, 0117
1:17:30 AM	E56	Dispatch from Command, Go ahead and start me a 2nd alarm, I've got heavy fire.....on side Charlie
1:17:37 AM	TAC 2-2	Engine 56 with heavy fire requesting 2nd alarm, 0117 (possibly walked on by 2253722-T404-P2)
1:18:04 AM	T18	Truck 18 En route
1:18:12 AM	TAC 2-2	Truck 18 talk group 4
1:18:18 AM	2253181	Open Carrier (EMS5-P)
1:18:40 AM	CC M 1-3-9	Carroll Medic 1-3-9 en route
1:18:44 AM	Tac 2-2	Carroll County Medic 1-3-9 I have you en route, report to the Royal Farms, that's where Medical is set up, 0118
1:18:56 AM	E56	Command to All Units,....victim we're looking for, middle age male....last scene on the 2nd floor, in the area of the stairwell
1:19:16 AM	2253354	Open Carrier (E2-P2)
1:19:21 AM	E56	EMS 5 when you arrive, I want you to assume Medical,....got a victim in the uh, patient's uh dwelling to the left
1:19:32 AM	UNK	Unintelligible.....dwelling.....
1:19:39 AM	TAC 2-2	Command from Dispatch, EMS 5 has Medical set up at the Royal Farms
1:19:45 AM	E56 Nozzle	Open carrier

1:19:50 AM	E56 Nozzle	56 Nozzle Command
1:20:08 AM	TAC 2-2	Engine 19 from Dispatch
1:20:13 AM	TAC 2-2	Upon your arrival, you can assume RIT
1:20:16 AM	E56 Nozzle	...56 Nozzle to Command
1:20:22 AM	E56	Go Ahead
1:20:25 AM	E56 Nozzle	Find another access to the fire in the 1st floor, we're trying to make the 2nd floor now, we got heavy heat up here
1:20:36 AM	E56	Received, you direct on the victim we're looking for?
1:20:41 AM	E56 Nozzle	Negative
1:20:44 AM	E56	We're looking for a middle, middle age male, was last seen,....by the stairwell on the 2nd floor
1:20:52 AM	E56 Nozzle	All right, send another crew up with the imager for search
1:21:14 AM	E56 Nozzle	56 Nozzle Command, also [get the] windows opened up
1:21:21 AM	E56	Yeah, that's what we're working on now on the exterior
1:21:28 AM	S414	Squad 414 en route driver only
1:21:32 AM	TAC 2-2	Squad 414 driver only, 0121

1:22:21 AM	E19	Engine 19 arrived assuming RIT
1:22:24 AM	TAC 2-2	Engine 19 with RIT, 0122
1:22:27 AM	2253681	open carrier (E312-P1)
1:22:32 AM	E503	Engine Tanker 5 zero 3's en route
1:22:35 AM	TAC 2-2	Engine 5 zero 3, 0122
1:22:38 AM	M19	Paramedic 19's arrived, staging with EMS Command
1:22:45 AM	TAC 2-2	Medic 19, 0122 (Walked on by E412)
1:22:49 AM	E56	Unit calling Command go ahead
1:22:52 AM	E412	Engine 412, I got a person in the front of the building who needs a medic unit, a civilian uh the ambulance crew's around here taking care of him, so if you need another one for the fire you gotta get 'em
1:23:18 AM	S414	414's arrived
1:23:21 AM	TAC 2-2	Squad 414,0123, Dispatch to Truck 313, Engine 431 Response Check, 0123
1:23:30 AM	E56 Nozzle	56 Nozzle to the crew from 41 (1st audible of PASS device shrill tone in the background is heard)
1:23:36 AM	E424	Engine 424 en route with 2
1:23:44 AM	BC22	Battalion 22 is arrived

1:23:47 AM	TAC 2-2	Battalion Chief 22, 0123 (Walked on by what seems to be 412 calling command)
1:24:00 AM	E56	Command, Engine 19, I need your assistance here on side ALPHA
1:24:18 AM	E424	Engine 424's en route
1:24:23 AM	TAC 2-2	Engine 424 I have you en route short, 0124
1:24:32 AM	E56	56 Nozzle from Command, you got an updated status on the interior
1:24:37 AM	E56 Nozzle	We're trying to push the 2nd floor but we got heavy heat, we gotta get that.....windows vented from the 2nd floor by the truck crew. (Audible PASS Device in Background)
1:24:51 AM	E56 Nozzle	MAYDAY, MAYDAY, MAYDAY.....MAYDAY, MAYDAY, MAYDAY
1:24:56 AM	TAC 2-2	ALERT 3 Tone, (underlying spoken what is thought to be from Command inquiring " Unit calling out the Mayday")
1:25:01 AM	TAC 2-2	Engine 56 portable 3 receiving a MAYDAY from Engine 56 portable 4, This talk group is now restricted. Engine 56 portable 4, what is your location? (walked on by Engine 56 portable, what is thought to say Engine 56 Portable 1, also hear PASS in background
1:25:24 AM	TAC 2-2`	Unit calling MAYDAY from Dispatch, What's your location?
1:25:28 AM	E56 Nozzle	2nd Floor Fire Attack Engine 56, we believe we got somebody from 41 down.....PASS alarm is going off
1:25:38 AM	E56	Jeff, he's with you.....is the MAYDAY with you?
1:25:44 AM	E56 Nozzle	Negative, we're trying to locate, on the 2nd floor

1:26:00 AM	E56	Jeff, this is command, repeat again, is the victim with you or not? I'm not clear on that
1:26:19 AM	E56	Received
1:26:53 AM	2253483	E56 portable, we're coming down the stairs (E56-P4)
1:27:12 AM	M2	Paramedic 2 arrived staging at the Royal Farms
1:27:17 AM	TAC 2-2	Medic 2 this talk group is command restricted, switch to WEST
1:27:27 AM	2253480	open carrier (E19-P1)
1:27:32 AM	BC22	open carrier
1:27:36 AM	BC22	Battalion 22 uh.....I'll be assuming command, go ahead dispatch
1:27:42 AM	TAC 2-2	Ok, we....that MAYDAY that was called was Engine 56 portable 4, were you able to get any additional information?
1:27:49 AM	BC22	Uh.....apparently it's uh with the report I'm getting is it's somebody from uh Company 41, on the 2nd floor stairwell, uh they're bringing him out now
1:28:00 AM	2253480	open carrier (E19-P1)
1:28:05 AM	BC22	Alright (PASS heard in background)
1:28:36 AM	2253473	open carrier (E211-P4)

1:28:43 AM	BC22	Command Dispatch (PASS audible in background)
1:29:02 AM	TAC 2-2	Ok , 0129
1:29:32 AM	2253181	open carrier (EMS5-P)
1:29:42 AM	2253480	open carrier (E19-P1)
1:29:48 AM	2253350	open carrier (E18-P3)
1:29:53 AM	BC22	Command to T18
1:29:59 AM	T18	Truck 18
1:30:01 AM	BC22	You on the scene yet?
1:30:04 AM	T18	Yeah, I'm comin up to you now
1:30:06 AM	BC22	All right, I need you to open up some of these windows on the 2nd floor
1:30:14 AM	T18	We're direct on that
1:30:30 AM	TAC 2-2	Command from Dispatch
1:30:33 AM	BC22	Command
1:30:35 AM	TAC 2-2	Ok, 424 just called arrived on talk group WEST, could you verify which firefighter off of what unit is injured? (walked on by 2253482 E19-P4)

1:30:46 AM	BC22	Yeah, I'll have that information for you In a minute
1:31:08 AM	E412	412 Command, could you please have Lt Borgman from 412's or 414 crew come to the engine.....Lt Borgman
1:31:28 AM	E312	312 mobile on division 2, I'm with (indiscernible)
1:31:40 AM	BC22	Unit on the inside, uh go ahead repeat that message (PASS device heard in background)
1:31:46 AM	E312	open carrier
1:31:51 AM	E312	I'm on Division 2 side DELTA we have heavy fire
1:31:56 AM	BC22	All right you say you're ready for water, got cha (PASS Audible)
1:32:01 AM	E312	Lieutenant off of 312 to Command
1:32:06 AM	BC22	312 Go
1:32:09 AM	E312	All right, we got another crew on the 2nd floor, they're involved with heavy fire
1:32:14 AM	BC22	2nd floor heavy fire?
1:32:18 AM	E312	That's correct, we're on the DELTA side and...(Indiscernible)
1:32:26 AM	2253674	Lieutenant (unk) heavy smoke, heavy smoke, very hard conditions (E312-P2)
1:32:36 AM	BC22	All right I got a 2nd hand line coming upstairs

1:32:41 AM	2253681	Yeah, we need a 2nd hand line...(Indiscernible).....on the 2nd floor (E312-P1)
1:33:37 AM	2253403	open carrier (T18-P3)
1:33:45 AM	CC M 9-9	Carroll Paramedic 9-9 en route
1:33:49 AM	TAC 2-2	Carroll County Medic 9-9 this talk group is command restricted, switch and respond on WEST
1:34:11 AM	M56	Medic 56, EMS 5.....en route to 218 (Note- this is the departure from the scene of FF Kirchner)
1:34:20 AM	TAC 2-2	Medic 56, EMS 5 to 218, 0134
1:34:27 AM	E312	(Open mike background conversation then) 312 to Command (Audible PASS in background)
1:34:37 AM	BC22	Command
1:34:39 AM	E312	We need another line back on CHARLIE side, we got heavy fire in the kitchen
1:34:44 AM	2253743	open carrier (E494-P1)
1:34:48 AM	BC22	56 (Indiscernible)
1:35:09 AM	TAC 2-2	Command from Dispatch, can you give an update?
1:35:19 AM	BC22	Dispatch from Command, it....we've got a 2 story wood frame dwelling, got heavy fire in the rear portion of the building. Uh I do have uh still an unreported uh victim still inside and I'll get you an update on the firefighter we pulled out
1:35:48 AM	428	Dispatch P2 (Indiscernible) 428 accidental

1:35:52 AM	TAC 2-2	Accidental, resetting, 0135
1:36:03 AM	2253254	open carrier (E17-P2)
1:36:23 AM	BC22	Medical from Command
1:36:44 AM	2253645	Division 2 to Command (S414-P4)
1:36:47 AM	BC22	pulling out Go ahead
1:36:50 AM	2253645	It appears we got fire on the 1st floor then (Indiscernible) (S414-P4)
1:36:57 AM	2253645	Looks like it's showing, starting to show through the floor (S414-P4)
1:37:03 AM	BC22	Command to Medical
1:37:39 AM	S322	Command from Squad 322, I have a victim, Division 2, coming out the front window
1:38:04 AM	2253137	open carrier (ACAD 45)
1:38:26 AM	BC22	Dispatch from Command (Audible PASS pre alert)
1:38:31 AM	BC22	Alright, MAYDAY is over, you can un restrict the talk group

1:38:42
AM

TAC 2-2

Attention all units on fire box 41-20 command advised, MAYDAY over, talk group no longer restricted, talk group no longer restricted at 0138.

SCBA and Personal Protective Equipment Inspections and Review of Other Official Reports

The SCBA and personal protective equipment of Firefighter Kirchner was collected at the scene by the Police Arson Squad and tagged as evidence. It was stored in the evidence locker of the Baltimore County Police Department at the Public Safety Building.

On Monday, June 3, 2013, members of the investigation team were present, and witnessed by Detective Kurt Wilhelm and Major Evan Cohen (Baltimore County Police Department), visually inspected the equipment.

At the conclusion of the inspection, various personal items and personal protective equipment that was the property of the Reisterstown Volunteer Fire Company was released to a company officer while the SCBA harness and regulator, air cylinder, and face piece were returned to the custody of Baltimore County Police after visual inspection.

Findings and Observations

On Friday, June 7, 2013, members of the investigation team were present, and witnessed by Detective Kurt Wilhelm, Baltimore County Police Arson Unit, the SCBA was tested by Safeware, Inc. Firefighter Kirchner's SCBA equipment was reassembled, and the SCBA regulators and harnesses, hoses, and air flow operations, and air quality, were tested for Firefighter Kirchner's equipment and the equipment worn by his partner. These test results were shared with the NIOSH investigation team.

The SCBA equipment was collected again by police and returned to the evidence locker. After the test, the committee members determined no additional testing was required.



The SCBA harness, regulator, and air cylinder were visually inspected. There was no evidence of exposure to extreme heat, all component parts were present, and there was no visual evidence of cracks, cuts, frays, or other signs of physical damage or destruction.



When examined, the cylinder had approximately 3,000 lbs of breathing air. On the scene, as Firefighter Kirchner was removed from the building, the Captain from Engine 19 leading the Rapid Intervention Team reports discovering the bottle valve in the closed position.



The regulator assembly and high pressure bypass valve appeared normal and functional.



SCBA Regulator



The PASS alarm air pressure gage indicates exposure to heat and soot from products of combustion. When Firefighter Kirchner was removed from the building, his PASS alarm was still sounding. The PASS was tested indicating it was working properly when activated manually, or when energized by turning on the SCBA bottle which causes the PASS to sound if the wearer becomes motionless.



(NOTE: The helmet was found on the floor near the bottom of the bed in the bedroom. The face piece and hood were found in the hallway at the second floor stair landing between the steps and the bedroom. During the inspection of the turnout gear and SCBA on June 3, it was discovered that the exhalation valve was missing from the face piece. Per police reports the exhalation valve was recovered the next day from the bedroom where Firefighter Kirchner was found. His left glove was also found in the bedroom. The right glove was found at the second step between the rails of the stairwell near the landing. Interviews indicate that the personal protective equipment items may have been spread during the rescue efforts and there was heavy foot traffic in the area as other firefighters continued search and rescue and firefighting operations.)





SCBA face piece in the condition as found after the rescue was completed and the fire was extinguished. The straps were partially pulled and were not fully extended. The lense was partially covered with dirt but was otherwise clear and intact.



Inspection revealed a melted plastic-like material adhered to the surface of the turnout coat sleeve. This material did not penetrate the liner or shell.

Note: Date of SCBA harness, regulator test, and inspection- August 14, 2012.

Date of SCBA facepiece fit test for Firefighter Kirchner- April 1, 2013.

Other Official Reports:

The committee reviewed the report submitted by the Baltimore County Police Department, Arson Investigation Unit. It indicates the fire started in the first floor kitchen but the exact cause is undetermined. (Report number CC# 131140107)

With the assistance of Dr. David Vitberg, the committee reviewed the ambulance (eMeds) report and the report of the Office of the Chief Medical Examiner. The reports do not suggest a cause for the reason Firefighter Kirchner collapsed during the search and rescue efforts. (Dr. Vitberg is an Associate Medical Director for the Baltimore County Fire Department) *Due to privacy concerns, these documents are not included in this report.*

The Office of the Chief Medical Examiner for the State of Maryland performed a post mortem exam on May 3, 2013, Case # 13-03701. The examination was done by Theodore M. King, Jr., M.D., Assistant Medical Examiner. The cause of death: *smoke inhalation and thermal injuries with complications.* The manner of the death: *accidental.*

In March 2014, the committee was given the opportunity to review and comment on the draft report from NIOSH.

Training and Certifications

According to training records and transcripts, Firefighter Kirchner possessed the following credentials:

Firefighter I	July 22, 2005
Hazardous Materials Operations	November 19, 2005
Hazardous Materials Awareness	June 30, 2006
Emergency Medical Technician-Basic	July 20, 2009
Rescue Site Operations and Vehicle and Machinery Rescue	November 17, 2009

Conclusions and Recommendations

List of Recommendations and Discussion-Analysis

Crew Integrity

1. *Company officers shall ensure that crew integrity is maintained at all times by all personnel operating in an IDLH environment. Crews should work in pairs when practicable.* The crew from Special Unit 418 limited their initial actions to delivering an abbreviated Initial Report (“Special Unit 418 arrived, I’ve got smoke showing”), and performing reconnaissance of the situation. They attempted to locate the seat of the fire and the last known location of trapped occupants based upon on-scene face-to-face reports of other occupants who escaped prior to their arrival. They then entered the front door just ahead of the two person crew from Engine 56 who were advancing a pre-connected hose line. The Special Unit 418 crew reached the second floor and separated to conduct primary search and rescue activities. At this point, the Captain and Fire Apparatus Driver/Operator from Engine 56, Engine 412, Medic 56, and Truck 404 were on location. After Firefighter Kirchner collapsed, he was found alone in a second floor bedroom, behind a closed door. When Firefighter Kirchner’s PASS alarm is first heard, the other firefighter from Special Unit 418 was in another area of the second floor conducting search operations.
2. *No personnel shall operate in an IDLH environment without a portable radio.* Special Unit 418 had a portable radio yet neither person took it into the building. Although they operated in the vicinity of the crew from Engine 56 with two portable radios, it is unclear whether having a radio would have helped the crew from Special Unit 418 request assistance sooner. The

Engine 56 crew first learned of Firefighter Kirchner's situation by hearing his PASS alarm sounding.

MAYDAY

1. *Crews should frequently drill using the procedures for initiating a MAYDAY as stipulated in SOP Tactical 09.* The activation of the PASS device on Firefighter Kirchner's SCBA, combined with the MAYDAY transmission by the nozzle firefighter on Engine 56 improved Firefighter Kirchner's chances for survival. Rescue efforts began immediately, Firefighter Kirchner was quickly found, and was removed from the building in a matter of minutes. A MAYDAY transmitted by the Engine 56 crew alerted all other fire ground companies, and units en route, so they could adjust tactics accordingly.

Incident Command

1. *Incident commanders must understand that an early initial 360° would give them the information needed to develop effective strategy and tactics for incident mitigation.* In this event, the Captain of Engine 56 performed this task immediately upon his arrival accompanied by a comprehensive Situation Status report to augment the Brief Initial Report from Special Unit 418. (Engine 56 arrived, 2 ½ story wood frame...got heavy smoke showing...we have a hydrant behind Engine 56. Captain Engine 56 has [command].) Furthermore, the smoke conditions and obstructed view of the house made it difficult to initially determine which house was involved in fire. The result was an early recognition of the probable location of the seat of the fire (Division 1: side Charlie) and the awareness to immediately escalate the incident by requesting a second alarm; knowing that initial crews would be committed to search and rescue, and moments later,

committed to rapid intervention to address the declared MAYDAY.

(“Dispatch from Command, go ahead and start me a second alarm...I’ve got heavy fire...on side Charlie.”)

2. *The Rapid Intervention Team (RIT) is a vitally important part of the Incident Command System.* Engine 19 was assigned the function of RIT (“Engine 19 from Dispatch, upon your arrival, you can assume RIT.”). This assignment was made approximately 4 ½ minutes before the MAYDAY was declared. Although the Engine 56 nozzle crew and the second crew member of Special Unit 418 located and started the removal of Firefighter Kirchner, Engine 19 as RIT joined them on the stairs to expedite his removal from the building. The MAYDAY was declared at 01:24:51 hours. At 01:34:11 hours, Medic 56 and EMS 5 departed the scene en route to Northwest Hospital Center with Firefighter Kirchner. This rapid intervention and removal was commendable and contributed to Firefighter Kirchner’s initial resuscitation efforts and improved his chances of survival. Furthermore, it is evident that interior crews engaged in “*active RIT*” meaning firefighters in position to do so, immediately redirected their priority and effort to locating Firefighter Kirchner. This further accelerated the rescue efforts and the committee endorses this practice in addition to establishing the RIT.

Strategy and Tactics

1. *Use caution when passing a hydrant that is in your direction of travel and close to the fire building.* Engine 56 decided to hand-drag a supply line to the hydrant to expedite their arrival to the scene. Given the facts of the situation, this calculated risk seems prudent as it allowed search and rescue and fire suppression activities to begin sooner. The hydrant proximity (within 100 feet) made it possible to secure the water source quickly. They also knew that another engine company was approaching the scene as this decision was being made.

Had the hydrant been further from the building, it may have been proper to stop at the hydrant to lay a supply line before proceeding.

SOP Tactical 08: Section 2: Engine Company Operations:

The engine's primary job is to safely and efficiently place the appropriate attack line in service to extinguish the fire. The most valuable life saving tactic performed at a fire is to put out the fire.

A. 1st arriving Engine. The 1st arriving engine, when dispatched as a Fire Box, should initiate a constant water supply. They should locate the closest water source in their response path and lead off. After wrapping the hydrant with the Humat and dry LDH, the engine shall proceed to a position on side Alpha of the structure. The 1st arriving engine may bypass the closest water source if it is within 100' of the structure and can be easily 'hand-jacked' by the Driver.)

- 2. Be prepared for unexpected building construction and occupancy features that are not readily visible that can affect fire dynamics.* As noted in the summary of building construction, a second set of interior stairs rose from the first floor to the second floor hallway terminating in front of the main stairwell used by fire attack and search and rescue crews. This allowed superheated smoke and fire gasses to travel quickly to the second floor. The crew from Engine 56 reported high heat conditions on the second floor and believed a flashover was imminent. They momentarily directed the nozzle stream at the ceiling hoping to reduce the heat. Recent studies indicate this is a prudent fire attack tactic to rapidly reduce heat and the possibility of flashover.

Furthermore, maneuvering was severely hampered by cluttered rooms and hallways. This inhibits traditional search and rescue patterns.

3. *When indicated, officers and crews should embrace the concept of transitional fire attack and ventilation coordinated with fire attack.* The International Association of Fire Chiefs, supported by research and testing, endorse the notion of initially attacking a fire from outside a structure to achieve quick knockdown and to improve dangerous environmental conditions for firefighters and victims. (see Appendix D) This attack must be coordinated with ventilation to control the flow of air, avoid introducing air such that the fire may actually intensify, and to allow the external application of water to be most efficient in rapidly cooling the interior environment. SOP Tactical 08 has been updated to embrace this concept and training continues throughout the department. There is evidence that on this incident, crews attempted to use this method by initially attacking the kitchen fire from outside the building before entering to complete fire suppression efforts.

Communications

1. *Frequent updates from Dispatch help crews prepare for strategy and tactical decisions upon arrival.* During the response, Dispatch continued to relay critical information as it was received by 911 and a police officer on the scene. This helped crews prepare for immediate search and rescue operations and confirmed the existence of a working fire. For example, an update provided by Dispatch from police car 326 (“advises two subjects still inside, smoke is thick from the front of location”) prompted EMS 5 to request two additional medic units. It is also important to ensure that critical information is transmitted to *both* police and fire/rescue/EMS units as dispatchers receive additional information from 911 calls or fire and police units on the scene.

2. *Control of incident communications is an effective aid to clear command and control.* The talk group dispatcher did a commendable job of tracking and controlling the flow of information and resource requests under stressful conditions.
3. *When units arrive at the scene, they should immediately call “arrived” so that a proper sequence of event time-stamps occur.* In this event, interviews revealed that several units called “arrived” well after their true moment of arrival and after conducting some initial survey actions. It is recommended that units call “arrived” when they arrive or on final approach to the scene and then update their transmission after initial actions occur or more information is gathered. Example: “Engine 1 arrived. Stand by for a brief initial report after our 360° survey.” Example: “Battalion Chief 2 arrived. Stand by for more information after I locate the command post and properly transfer command.”

Training

1. *Personnel must fully don SCBA before entering an IDLH environment.*
Witness statements indicate Firefighter Kirchner was wearing his SCBA harness and face mask when he entered the building. We are unable to determine if or when he attached the regulator and began breathing air from the SCBA.
SOP 400-27A- Section 4: Use of Respirators
A. Policy for Use
 1. *All members shall use respiratory protection when they may be exposed, or potentially exposed, to respiratory hazards that are an IDLH.”) This limits the exposure to toxins and products of combustion and allows the firefighter to observe, diagnose, or correct any SCBA problems in a safer, non-IDLH environment.*
2. *The ability to buddy breathe and diagnose SCBA difficulties in an IDLH environment are critical skills for survival that require constant training to ensure proficiency.*

Firefighter Kirchner was found lying on the floor behind the entry door to a second floor bedroom. This door was approximately six feet from the top of the staircase leading to the first floor. When found, he was not wearing his SCBA face piece, his gloves, helmet or hood. FF Kirchner's bottle was found to be in the "off" position once he was brought to the front porch by the rapid intervention efforts. When the SCBA was tested during the investigation, it was found to be functioning properly including the positive pressure feature of the system. Firefighters working in the area do not report hearing any high pressure air escaping as is commonly heard when the SCBA system is properly activated and a face seal is broken. While we are unable to determine exactly what occurred to create this situation, it is imperative for firefighters to fully don the SCBA and activate it before entering an IDLH, and to be able to diagnose SCBA problems and correct them in a non IDLH environment to avoid respiratory exposure to products and conditions of fire. Personnel encountering an SCBA problem in an IDLH environment should immediately declare a MAYDAY, activate the PASS device, and leave the building and/or seek an area of refuge to correct the problem. Survival breathing skills and evolutions, and SCBA inspections, must occur frequently at the company level to ensure all personnel are competent in these procedures. SOP 400-14 requires monthly training involving SCBA use. "Two (2) hours of the monthly training shall be spent on SCBA use, survival skills, and associated preventive maintenance." The Baltimore County Volunteer Firemen's Association Senior Officers Committee is reviewing annual training expectations to ensure all active members with white personnel accountability tags are refreshed on SCBA survival breathing skills.

Personal Protective Equipment Maintenance and Inspection

1. *As most personal protective equipment (PPE) is issued to and under the custody of individual personnel, it is imperative that personnel regularly inspect this PPE.* Based upon an inspection by the investigation team, Firefighter Kirchner's firefighting PPE was compliant with NFPA 1971 standards, was in good condition and provided the proper protection against thermal injury. Subsequent testing by an independent agency determined that the SCBA harness apparatus, hoses and regulator were working properly and the SCBA bottle had air and was of the proper air quality. The SCBA was able to supply a positive pressure air flow to the wearer. Records indicate Firefighter Kirchner was fit tested at the company level on April 1, 2013 and the SCBA was tested and inspected on August 14, 2012.

Glossary of Terms

360° - a survey of the incident by quickly circling the scene to gather intelligence used to formulate strategy and tactics.

1-3/4" pre connected hand line- a portable hose line used by firefighters to enter a building to suppress a fire.

Alert 3 tones- a sound transmitted by the dispatcher to catch the attention of all crews when delivering important messages.

Ambulance/IV/Medic/Paramedic- a vehicle to treat and transport injured or ill persons. Ambulance is the term used when the crew consists of basic life support providers. IV is used if the crew is trained to start intra venous therapy. Medic is used in the crew consists of advanced life support providers and Paramedic is used in the crew has a Nationally Registered Emergency Medical Technician-Paramedic provider.

Back-up firefighter- the firefighter in the position behind the nozzle position providing support and assistance with maneuvering the hose line.

Battalion Chief 22- the battalion commander (Battalion Fire Chief) supervising the Second Battalion on B-Shift (the western area of Baltimore County)

BIR- brief initial report; the first description of the incident scenario/conditions observed by the first unit to arrive.

Command- the person or location controlling incident operations.

Defensive attack- a strategy whereby firefighters attack a fire from outside a building. Often used when it is unsafe to enter the building based upon structural conditions or untenable fire conditions.

Direct- a term used to indicate the receiver understood the message delivered.

Dispatch- the person or facility coordinating radio transmissions to, from, and between responding crews and apparatus.

Division 1, 2, 3- a terminology method to designate the first, second, and third levels of a structure.

EMS 5- the emergency medical services supervisor operating generally in the Reisterstown Road corridor area of Baltimore County.

Engine- a fire apparatus vehicle designed to suppress fires.

Engine Tanker- a fire apparatus vehicle designed to suppress fires but also carrying a large quantity of water.

Humat- an appliance used to connect a supply hose to a fire hydrant allowing firefighters to control the flow of water.

IDLH environment- an incident scene where the environmental and atmospheric conditions are **I**mmediately **D**angerous to **L**ife and **H**ealth. Such conditions require the use of proper respiratory protection devices.

LDH- large diameter hose used to supply water from the source to a fire engine.

MAYDAY- a term transmitted by firefighters in distress.

Medical- a term to identify the person or function of managing and coordinating medical operations within the incident command system.

Nozzle (nozzle firefighter)- the firefighter who takes the hose nozzle position to suppress the fire.

Offensive attack- a strategy whereby firefighters enter a building to fight a fire.

Open carrier- a situation where a radio is keyed to transmit but no voice sound is heard.

PASS device- **P**ersonal **A**lerting **S**afety **S**ystems device that sounds a shrill tone if a firefighter becomes motionless or manually triggers the alarm. It is activated and on stand-by once the SCBA bottle is turned on introducing air pressure into the system.

Portable- the hand carried radio used by firefighters to communicate with each other.

Primary and secondary search and rescue- the actions performed by firefighting crews to search once quickly, then again more thoroughly, for victims.

RIT/Rapid Intervention Team- a group of firefighters assigned to be ready to quickly intervene to rescue firefighters in distress during operations.

SCBA- self contained breathing apparatus- the air packs worn by firefighters. The system supplies positive pressure meaning that if there is a leak in the face piece seal against the firefighter's facer, clean breathing air from the SCBA bottle is forced through the opening preventing toxic air from entering the mask.

SCBA face piece- the mask worn by firefighters.

SCBA regulator- the portion of the breathing apparatus where high pressure air from the bottle is converted to a pressure breathable to firefighters.

Second Alarm- an additional group of emergency response resources to combat an event that requires more than the initial group of units sent to the scene.

Side Alpha, Bravo, Charlie, Delta- designates the four sides of a building or event. Alpha is the front of the building and Bravo is the side immediately to the left, or clockwise, continuing to Charlie (the rear) and then Delta.

Special Unit- a fire response vehicle that can be used for special purposes to support incident responses.

Squad- a fire apparatus vehicle typically assigned for rescue operations and to supply flood lights.

Staging- having responding apparatus take an uncommitted position upon arrival before they are given specific tasks to perform.

Supply line- the hose line that brings water from a source (like a fire hydrant) to the fire engine.

Talkgroup- a radio position (like a channel) where units operating together are able to communicate.

Talkgroup Main 1- used by fire dispatch to transmit incidents requiring a response.

Talkgroup Tac 22- used by dispatch and crews responding to and operating on incidents in the second battalion area.

Talkgroup is restricted- a condition when Command or Dispatch asks units to refrain from making radio transmissions unless the message is urgent or relates to an existing critical situation.

Transitional attack- a strategy whereby firefighters first attack a fire from outside to quickly interrupt the fire propagation process and then may enter the building to complete search and rescue and firefighting operations.

Truck – a fire apparatus vehicle that carries ladders and typically performs search and rescue and ventilation tactics.

Voicemitter- a battery operated device attached to the SCBA face piece designed to amplify and clarify voice transmissions.

Windows “opened up”- the tactic of breaking or opening windows so that super heated smoke, heat, and gases can escape to improve interior atmospheric conditions for victims and firefighters.

Walked on- a situation when more than one radio operator tries to speak at the same time creating a garbled radio transmission.

White Personnel Accountability Tags- a credential that indicates a person is qualified as a firefighter to enter and operate in IDLH environments using SCBA.

Appendix A: SCBA Test Results



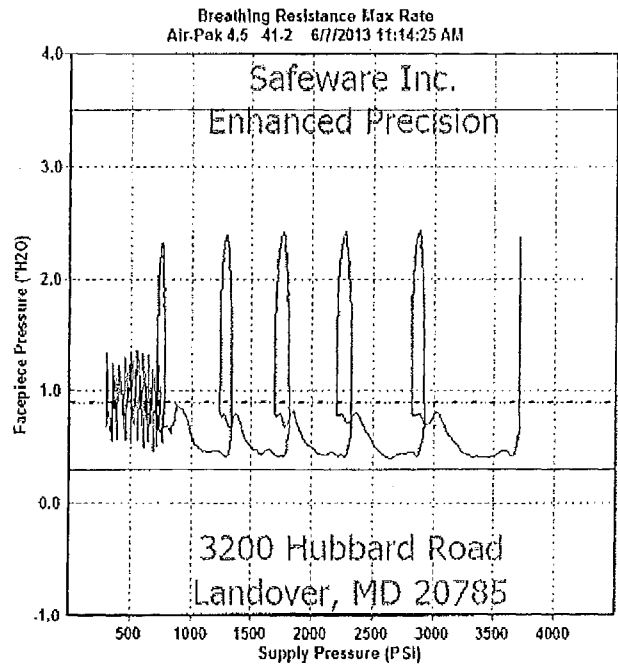
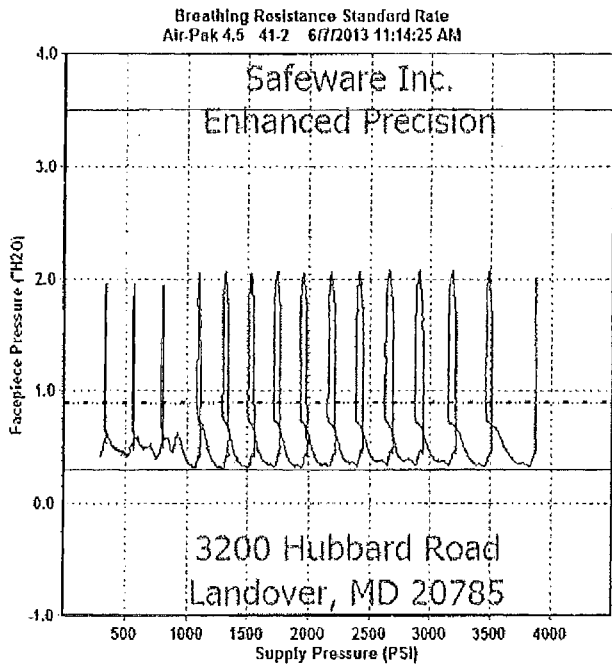
Posi3 USB Test Results Functional Test

6/7/2013 11:14:25 AM

Scott
Air-Pak 4.5
Unit ID: 41-2

Posi3 USB serial # L00670 - Calibration was up to date when the test was performed

Auxiliary IDs		Functional Tests			
-		Exhalation Pressure	Pass	2.0	"H2O
Regulator	XXXXXXXXXX	Facepiece Leakage	Pass	0.1	"H2O
Reducer	99700177	Positive Pressure	Pass	0.9	"H2O
-		Primary Lockup	Pass	91.0	PSI
-		Primary Creep	Pass	-2.5	PSI
-		Air Saver Switch Activation	Pass	-4.0	"H2O
-		Transfer	Pass	1067	PSI
Visual Inspection		Secondary Lockup	Pass	155.4	PSI
Facepiece		Secondary Creep	Pass	-0.7	PSI
Backframe/Harness	Pass	High Pressure Leakage	Fail	77	PSI
Cylinder	Pass	Secondary Pr. at High Cylinder	Pass		
Low Pressure Warning	Pass	Purge	Pass	189	L/min
Hoses	Pass	Alarm Activation Pressure			
Manifold Volume: 0.083		HP Vibralert	Pass	1067	PSI
Gauge Accuracy					
HP Numbers Pass					
1000 PSI		2000 PSI		3000 PSI	
Pass	912	Pass	2059	Pass	3016



Minimum	Maximum		Breathing Results	Minimum	Maximum	
0.3 "H2O	2.1 "H2O	Pass	Facepiece Pressure	0.4 "H2O	2.4 "H2O	Pass

6/7/2013 11:40:49 AM - John Kirkeby: Batteries in PASS are low but still goes into alarm mode. Could not find high pressure lea.k

6/7/2013 11:41:15 AM - John Kirkeby: Tested with Safeware test mask.

Tested by : John Kirkeby
Safeware Inc.

Signature

3200 Hubbard Rd. Landover MD. 20785

Page 1

EP
Version 4.0.6.171S

Aircheck Report and Certificate

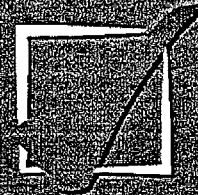
From:
Trace Analytics, LLC
15768 Hamilton Pool Road
Austin, Texas 78738

800-247-1024 • 512-263-0000
Fax 512-263-0002
E-mail service@AirCheckLab.com

To:
Mr. Chris Fields
Safeware
3200 Hubbard Road
Landover, MD 20785
(301) 683-1234

TRACE Analytics LLC

Report 13-15203, Sampled on
6/7/2013



Analysis Certificate

Sample Listed As Other; Due Date
Unspecified

BALTIMORE COUNTY FIRE DEPARTMENT
IS IN COMPLIANCE WITH THE AIR/GAS QUALITY PORTION OF THE SPECIFICATION:
NFPA 1989-2013 (N) & CGA G-7.1-2011 GRADE D (0)
AS ANALYZED AND REPORTED ON THIS CERTIFICATE
FOR THE SAMPLE DESCRIBED UNDER SECTION "SAMPLE & REPORT INFORMATION"



ACCREDITED
American Assn for Laboratory Accreditation
1991; Certificate No. 322.01 Chemical Field of Testing

R.A. Smith
Richard A. Smith, Laboratory Director

Analytical Test Methods	Media Sampled	Estimate of Uncertainty
Gases & Vapors: CAT-A-01 Gas Chromatography/Mass Spectrometry	Source Bottle: 759161	The average analytical uncertainty (k=2) is 98.8±2.4% (relative) at the specification limit for the ten compounds normally reported. For uncertainty information for a specific compound, contact Trace.
Oil & Particulate: CAT-A-03 Analytical Gravimetry	Ambient Bottle: N/A	
Particle Size: CAT-A-04 Optical Microscopy	Source Filter: 145802	

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Sample & Report Information

Results of Test: PASS

Sampled For	Analytes	Source Results	Ambient Results	Specification ¹ Allowable Limits
Baltimore County Fire Department	Oxygen, Volume %	20.7	N/A	19.5-23.5
Sampled By: John Kirkeby	Nitrogen, Volume %	78.4	N/A	75.0-81.0
Sampled On: 6/7/2013	Argon, Volume %	0.9	N/A	N/A
Received On: 6/14/2013	Nitrogen Plus Argon, Volume %	79.3	N/A	N/A
Analyzed On: 6/14/2013	Carbon Monoxide (CO), ppmv	<0.3	N/A	5
Sampled From: Stored Air	Carbon Dioxide (CO ₂), ppmv	353	N/A	1000
Make: Scott	Water Content (H ₂ O), ppmv/Dewpoint, °F	7.4 / -81	N/A	24 / -65 (W)
	Atmospheric Dew Point, °F (DT)	-77	N/A	N/A
Cylinder(s): IL 7173	TVHC (including CH ₄), ppmv	2.9	N/A	N/A
Other ID: 41-4	Methane (CH ₄), ppmv	2.9	N/A	N/A
	TVHC (excluding CH ₄), ppmv	<0.7	N/A	25
	Oil (condensed) & Particulate, mg/m ³	0.05	N/A	2
	Odor (provided by customer)	Not Pronounced	N/A	Not Pronounced
Sample Phase: Routine	Other	N/A	N/A	N/A
Customer Comments	Other	N/A	N/A	N/A
	Other	N/A	N/A	N/A

PASS

(N) The Analysis Certificate refers to compliance of the referenced air sample with NFPA 1989 5.6 Breathing Air Quality Requirements, not the entirety of NFPA 1989.
(0) CGA G-7.1 notes the typical use for Grade D as "OSHA breathing air" and for Grade L as "SCBA air".
(W) Dew point is expressed in °F at one atmosphere pressure absolute.
(DT) Dew point is calculated from the detector tube reading.

Report Number: 13-15203
Customer ID: 3518
Date Reported: 6/17/2013
Frequency: Other
Next Sample Due Approx: **Unspecified**



TRACE Analytics LLC

15768 Hamilton Pool Road
Austin, Texas 78738

Fax 512-263-0002
800-247-1024 • 512-263-0000

www.AirCheckLab.com
service@AirCheckLab.com

ANALYSIS CERTIFICATE

To: Mr. Chris Fields
Safeware
3200 Hubbard Road
Landover, MD 20785
(301) 683-1234

BALTIMORE COUNTY FIRE DEPARTMENT

THIS BREATHING AIR HAS BEEN TESTED TO THE REQUIREMENTS OF NFPA 1989, 2013 EDITION

Scott Routine NEXT SAMPLE DUE ON OR BEFORE Unspecified



American Assn for Laboratory Accreditation
1991: Certificate No. 322.01 Chemical Field of Testing

*Results relate only to items tested.
This certificate shall not be reproduced
except in full without the written
permission of Trace Analytics, LLC*

Report Number	13-15203
Customer ID	3518
Sampled On	6/7/2013

Received On	6/14/2013
Analyzed On	6/14/2013
Date Reported	6/17/2013
Frequency	Other

We Do One Thing - Test Compressed Air

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www.AirCheckLab.com



TRACE
Analytics LLC

15768 Hamilton Pool Road
Austin, Texas 78738
800-AIR-1024 or 512-263-0000 • Fax: 512-263-0002
E-mail: ServiceTeam@AirCheckLab.com



Last Report No.: 13-15203
Last Sample Date: 6/7/2013

SOME INFORMATION BELOW IS PREPRINTED FROM YOUR PREVIOUS AIR TEST. IF ANY OF THE INFORMATION HAS CHANGED OR IS INCORRECT, PLEASE MARK ONE LINE THROUGH IT AND CAREFULLY PRINT THE CORRECT INFORMATION.

1 Contact Information

Customer ID: 3518 Customer Name: Safeware Country: USA

Contact: Mr. Chris Fields E-mail: cfields@safewareinc.com Phone: (301) 683-1234 Fax: _____

Alternate: Ms. Sue Fields E-mail: sfields@safewareinc.com Phone: (301) 683-1212 Fax: _____

Please check box to the left if you'd like the AirCheck Report sent to the person below (fill in information).

Contact: _____ E-mail: _____

2 Rush Analysis Request

IMPORTANT: PLEASE CALL 1-800-247-1024 (ext. 2) or 1-512-263-0000 (ext. 2) TO SCHEDULE

RUSH By marking this box, I understand that I am authorizing Same Day Analysis & Reporting for an additional \$100 per sample. Initial here: _____

3 Purchase Order Information (if applicable)

5 Customer Comments (use back if needed)

PO Number: _____ PO Valid Thru: _____

4 System Information

6 Sampled By and Sample Date

System ID: 134247

Sampled For: Baltimore County Fire Department

Testing Schedule:
 45 Days Monthly Semi-Annual
 120 Days Other Startup
 Annual Quarterly Verification
 Bimonthly Random Sample Weekly

SIGNATURE _____ PRINT Name (Person taking the test sample) _____

Date Sample Taken: _____

MONTH DAY YEAR

Air Spec: NFPA 1989-2013 (N) & CGA G-7.1-2011 Grade D (0)

- If above is incorrect, indicate air spec below:
- OSHA 1910.134-Cylinders OSHA 1910.134-Compressor
 - OSHA 1910.430-Com. Diving Fire - NFPA 1989
 - CGA Grade D-SCBA CGA Grade D2-not SCBA
 - Sport Diving - CGA Grade E Other _____
 - CSA(>2216 psig) CSA(15-2216 psig) CSA<15 psig

Submittal of this air sample authorizes Trace Analytics, LLC to provide services. If a purchase order number is required by your company, please attach it to this data sheet or write it in the spaces provided in section "3". I attest that all information provided on this datasheet is truthful and accurate to the best of my knowledge.

Make: Scott

Model: _____

Serial No: _____

Cylinder: IL 7173

Other ID: 41-4

Pressure: High Pressure (1,000-6,000 psi)
 Low Pressure (less than 1,000 psi)

Air used for: SCBA Airline Respirator
 SCUBA Other

Purification: Molecular Sieve/Desiccant No Purification
 Refrigerated Dryer Unknown
 No Dryer

Sampled From: Compressor Source Other
 Stored Air Outlet Not Provided
 Comp. & Storage Breather Box

Comp. Hours: _____

(Lowest temp, low pressure breathing air may be exposed to during the year)

Lowest Temp: _____ °F °C

Sample Phase: Before Filter Change After Filter Change Routine

7 Sample Information

Is this sample a Retest taken within 30 days of a failed test? Yes No

A Source Bottle, Filter, and Data Sheet MUST BE RETURNED for a complete analysis.

Filter Number (red or green label)	_____	_____	_____	_____	_____
Flowrate (liters per minute)	_____	_____	_____	_____	_____
Sample Time (minimum of 10 min.)	_____	_____	_____	_____	_____

Detector Tube (OMIT data if sampling media does not include Detector Tube)

Tube Reading (0 - 200)	_____	_____	_____	_____	_____
Total Minutes Sampled	_____	_____	_____	_____	_____
Source Bottle Number (blue label)	_____	_____	_____	_____	_____
Ambient Bottle Number (white label)	_____	_____	_____	_____	_____

Odor is REQUIRED. It's determined by sniffing the air from the side port of the Bottle Holder. MARK ONLY ONE. None/Slight Pronounced

PLEASE NOTE:

Sample Shelf Life

Once a sample is taken, it must be received by our laboratory within 60 days. NO EXCEPTIONS.

Shelf Life

Sampling media must be used or returned for free replacement within 2 years of shipment date. See expiration date on return box.

Next Sample Due Approx: Unspecified

- For TRACE Use Only - CPPDS

DT Reading: Red / Gray

Receiving I.D.

Receiver's Initials


Sampling Notes for Water Vapor Detector Tube

1: Break BOTH lips of detector tube before inserting. Arrow on tube points away from Fitting. 50 LPM for 10 minutes.

2: The DT is filled with yellow filler material that reacts to the presence of water by changing color from yellow to a grayish/reddish brown. At any time during the 10 minute test if color change reaches 200 mark, remove tube and note elapsed time on data sheet.

Reading the Detector Tube for High Pressure Air Used for SCBA

The purpose of providing a detector tube for onsite testing is to allow you the opportunity to correct a problem without having to wait for the complete report. To determine if your sample passes; identify the farthest color change on the tube between 0 and 200; locate that number on chart below; identify the flowrate you took your sample on the left hand side of chart between 40 and 60; where the two readings intersect is the approximate result in °F. For example: If tube showed color change to 50, and flowrate was 50 LPM, the result would be -49°F. The number between 0 and 200 should be written on the data sheet not the dew point from the chart below.



Det. Tube Reading, mg/m ³	2.5	5	10	20	30	40	50	60	70	80	90	100	125	175	200	
Flowrate Reading	60	-93	-84	-75	-66	-60	-56	-52	-49	-47	-45	-43	-42	-38	-33	-31
55	-92	-83	-74	-65	-58	-54	-51	-48	-45	-44	-42	-40	-36	-31	-29	
50	-90	-81	-72	-62	-56	-52	-49	-46	-44	-42	-40	-38	-34	-29	-27	
45	-88	-79	-70	-60	-54	-50	-47	-44	-41	-39	-38	-36	-32	-26	-24	
40	-86	-77	-68	-58	-52	-47	-44	-41	-39	-36	-35	-33	-29	-23	-21	

PASS	FAIL
------	------

Above area marked "Pass" is for high pressure air used for SCBA; with a -65°F limit per CGA Grade D/NFPA 1989. See AirCheck Notebook Instructions for complete range of flowrates and further details.

If your detector tube reading indicates that you have a problem (anything outside of the PASS area in chart above); go through the following checklist; take corrective action; then retake your sample to see if the problem has been corrected. The 2nd test is free. Submit both samples for analysis to Trace's laboratory.

Troubleshooting Checklist

Purification filters/ Depressurized filters	High ambient air temperatures (above 70°F) affect the operating life of the cartridge. Chemicals used in purification filters begin to degrade as soon as they are installed. Is it time to change the filters?
Manual/auto drain or priority valve	If not working properly can be source for excess water and reduce filter life.
Remote fill or hose reel	Long lengths (>25 ft) of hose are notorious for accumulating and retaining water. A short 1-2 minute purge WILL NOT be sufficient. It is best to take sample from a short fill hose (5-10 ft) or directly from containment fill station. - View our resource videos at www.AirCheckLab.com
Recent hydrostat	Bottles must be properly dried after hydrostat and should be immediately pressurized with dry air.
Valves left open	Ambient air can easily have 10,000 - 50,000 ppm of water. Purge sufficiently to remove water accumulated from ambient air.
Sample taken from storage	Take sample from compressor to identify if compressor is producing dry air. If yes, storage banks may contain excess water. Drain and refill with dry air. This may require 2-3 fills to drive off water from inside cylinders. You can request extra detector tubes (\$10 ea) to do several checks for water without doing a complete air sample.
Detector tube cracked	Only the lips of the tube should be broken. If a crack runs down the main body of the tube, results will not be dependable.
Tube fitting wet	If multiple samples are taken consecutively, excess water may pool inside the fitting. Dry fitting between uses.
Other	Keep in mind that 1 milliliter (which is about 20 drops from an eyedropper) in a 1.7 cubic ft cylinder at 4500 psig would be 90 ppm of water vapor. It doesn't take much to fail.

Aircheck Report and Certificate

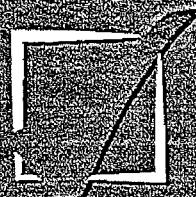
From:
Trace Analytics, LLC
15768 Hamilton Pool Road
Austin, Texas 78738

800-247-1024 • 512-263-0000
Fax 512-263-0002
E-mail service@AirCheckLab.com

To:
Mr. Chris Fields
Safeware
3200 Hubbard Road
Landover, MD 20785
(301) 683-1234

TRACE Analytics, LLC

Report 13-15202, Sampled on
6/7/2013



Analysis Certificate

Sample Listed As Other, Due Date
Unspecified

BALTIMORE COUNTY FIRE DEPARTMENT
IS IN COMPLIANCE WITH THE AIR/GAS QUALITY PORTION OF THE SPECIFICATION:
NFPA 1989-2013 (N) & CGA G-7.1-2011 GRADE D (0)
AS ANALYZED AND REPORTED ON THIS CERTIFICATE
FOR THE SAMPLE DESCRIBED UNDER SECTION "SAMPLE & REPORT INFORMATION"



American Assn for Laboratory Accreditation
1991: Certificate No. 322.01 Chemical Field of Testing

R.A. Smith
Richard A. Smith, Laboratory Director

Analytical Test Methods	Media Sampled	Estimate of Uncertainty
Gases & Vapors: CAT-A-01 Gas Chromatography/Mass Spectrometry	Source Bottle: 758138	The average analytical uncertainty (k=2) is 98.8±2.4% (relative) at the specification limit for the ten compounds normally reported. For uncertainty information for a specific compound, contact Trace.
Oil & Particulate: CAT-A-03 Analytical Gravimetry	Ambient Bottle: N/A	
Particle Size: CAT-A-04 Optical Microscopy	Source Filter: 150650	

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Sample & Report Information

Results of Test: PASS

Sampled For	Sampled By	Sampled On	Received On	Analyzed On	Sampled From	Make	Analytes	Source Results	Ambient Results	Specification ¹ Allowable Limits
Baltimore County Fire Department	John Kirkeby	6/7/2013	6/14/2013	6/14/2013	Stored Air	Scott	Oxygen, Volume %	21.0	N/A	19.5-23.5
							Nitrogen, Volume %	78.1	N/A	75.0-81.0
							Argon, Volume %	0.9	N/A	N/A
							Nitrogen Plus Argon, Volume %	79.0	N/A	N/A
							Carbon Monoxide (CO), ppmv	<0.3	N/A	5
							Carbon Dioxide (CO ₂), ppmv	347	N/A	1000
							Water Content (H ₂ O), ppmv/Dewpoint, °F	4.5 / -88	N/A	24 / -65 (W)
							Atmospheric Dew Point, °F (DT)	-65	N/A	N/A
							TVHC (including CH ₄), ppmv	2.7	N/A	N/A
							Methane (CH ₄), ppmv	2.7	N/A	N/A
							TVHC (excluding CH ₄), ppmv	<0.7	N/A	25
							Oil (condensed) & Particulate, mg/m ³	<0.04	N/A	2
							Odor (provided by customer)	Not Pronounced	N/A	Not Pronounced
							Other	N/A	N/A	N/A
							Other	N/A	N/A	N/A
							Other	N/A	N/A	N/A

PASS

(N) The Analysis Certificate refers to compliance of the referenced air sample with NFPA 1989 5.6 Breathing Air Quality Requirements; not the entirety of NFPA 1989.
(O) CGA G-7.1 notes the typical use for Grade D as "OSHA breathing air" and for Grade L as "SCBA air".
(W) Dew point is expressed in °F at one atmosphere pressure absolute.
(DT) Dew point is calculated from the detector tube reading.

Report Number: 13-15202
Customer ID: 3518
Date Reported: 6/17/2013
Frequency: Other
Next Sample Due Approx: **Unspecified**

TRACE Analytics LLC

15768 Hamilton Pool Road
Austin, Texas 78738

Fax 512-263-0002
800-247-1024 • 512-263-0000

www.AirCheckLab.com
service@AirCheckLab.com

ANALYSIS CERTIFICATE

To: Mr. Chris Fields
Safeware
3200 Hubbard Road
Landover, MD 20785
(301) 683-1234

BALTIMORE COUNTY FIRE DEPARTMENT

THIS BREATHING AIR HAS BEEN TESTED TO THE REQUIREMENTS OF NFPA 1989, 2013 EDITION

Scott Routine NEXT SAMPLE DUE ON OR BEFORE Unspecified



American Assn for Laboratory Accreditation
1991: Certificate No. 322.01 Chemical Field of Testing

*Results relate only to items tested.
This certificate shall not be reproduced
except in full without the written
permission of Trace Analytics, LLC*

Report Number	13-15202
Customer ID	3518
Sampled On	6/7/2013

Received On	6/14/2013
Analyzed On	6/14/2013
Date Reported	6/17/2013
Frequency	Other

We Do One Thing - Test Compressed Air

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www.AirCheckLab.com



TRACE
Analytics LLC

15768 Hamilton Pool Road
Austin, Texas 78738
800-AIR-1024 or 512-263-0000 • Fax: 512-263-0002
E-mail: ServiceTeam@AirCheckLab.com



Last Report No.: 13-15202
Last Sample Date: 6/7/2013

SOME INFORMATION BELOW IS PREPARED FROM YOUR PREVIOUS AIR TEST. IF ANY OF THE INFORMATION HAS CHANGED OR IS INCORRECT, PLEASE MARK ONE LINE THROUGH IT AND CAREFULLY PRINT THE CORRECT INFORMATION.

1 Contact Information

Customer ID: 3518 Customer Name: Safeware Country: USA
 Contact: Mr. Chris Fields E-mail: cfields@safewareinc.com Phone: (301) 683-1234 Fax:
 Alternate: Ms. Sue Fields E-mail: sfields@safewareinc.com Phone: (301) 683-1212 Fax:
 Please check box to the left if you'd like the AirCheck Report sent to the person below (fill in information).
 Contact: E-mail:

2 Rush Analysis Request

IMPORTANT: PLEASE CALL 1-800-247-1024 (ext. 2) or 1-512-263-0000 (ext. 2) TO SCHEDULE

RUSH By marking this box, I understand that I am authorizing Same Day Analysis & Reporting for an additional \$100 per sample. Initial here:

3 Purchase Order Information (if applicable)

5 Customer Comments (use back if needed)

PO Number: PO Valid Thru:

4 System Information

6 Sampled By and Sample Date

System ID: 134208
 Sampled For: Baltimore County Fire Department
 Testing Schedule: 45 Days Monthly Semi-Annual
 120 Days Other Startup
 Annual Quarterly Verification
 Bimonthly Random Sample Weekly
 Air Spec: NFPA 1989-2013 (N) & CGA G-7.1-2011 Grade D (0)
 If above is incorrect, indicate air spec below:
 OSHA 1910.134-Cylinders OSHA 1910.134-Compressor
 OSHA 1910.430-Com. Diving Fire - NFPA 1989
 CGA Grade D-SCBA CGA Grade D2-not SCBA
 Sport Diving - CGA Grade E Other
 CSA (>2216 psig) CSA (15-2216 psig) CSA <15 psig
 Make: Scott
 Model:
 Serial No:
 Cylinder: IL 7277
 Other ID: 41-13
 Pressure: High Pressure (1,000-6,000 psi)
 Low Pressure (less than 1,000 psi)
 Air used for: SCBA Airline Respirator
 SCUBA Other
 Purification: Molecular Sieve/Desiccant No Purification
 Refrigerated Dryer Unknown
 No Dryer
 Sampled From: Compressor Source Other
 Stored Air Outlet Not Provided
 Comp. & Storage Breather Box
 Comp. Hours:

SIGNATURE: PRINT Name (Person taking the test sample)
 Date Sample Taken: MONTH DAY YEAR

Submission of this air sample authorizes Trace Analytics, LLC to provide services. If a purchase order number is required by your company, please attach it to this data sheet or write it in the spaces provided in section "3". I attest that all information provided on this datasheet is truthful and accurate to the best of my knowledge.

7 Sample Information

Is this sample a Retest taken within 30 days of a failed test? Yes No

A Source Bottle, Filter, and Data Sheet MUST BE RETURNED for a complete analysis.

Filter Number (red or green label)
 Flowrate (filters per minute)
 Sample Time (minimum of 10 min.)
 Detector Tube (OMIT data if sampling media does not include Detector Tube)
 Tube Reading (0 - 200) Total Minutes Sampled
 Source Bottle Number (blue label)
 Ambient Bottle Number (white label)

Odor is REQUIRED. It's determined by sniffing the air from the side port of the Bottle Holder. MARK ONLY ONE. None/Slight Pronounced

PLEASE NOTE:

Sample Shelf Life
 Once a sample is taken, it must be received by our laboratory within 60 days. NO EXCEPTIONS.

Shelf Life
 Sampling media must be used or returned for free replacement within 2 years of shipment date. See expiration date on return box.

For TRACE Use Only - CPPDS

DT Reading: Red / Gray Receiving I.D. Receiver's Initials

We Do One Thing - Test Compressed Air

www.AirCheckLab.com

Next Sample Due Approx: Unspecified




Sampling Notes for Water Vapor Detector Tube

1: Break BOTH tips of detector tube before inserting. Arrow on tube points away from Fitting. 50 LPM for 10 minutes.

2: The DT is filled with yellow filler material that reacts to the presence of water by changing color from yellow to a grayish/reddish brown. At any time during the 10 minute test if color change reaches 200 mark, remove tube and note elapsed time on data sheet.

Reading the Detector Tube for High Pressure Air Used for SCBA

The purpose of providing a detector tube for onsite testing is to allow you the opportunity to correct a problem without having to wait for the complete report. To determine if your sample passes; identify the farthest color change on the tube between 0 and 200; locate that number on chart below; identify the flowrate you took your sample on the left hand side of chart between 40 and 60; where the two readings intersect is the approximate result in °F. For example: If tube showed color change to 50, and flowrate was 50 LPM, the result would be -49°F. The number between 0 and 200 should be written on the data sheet not the dew point from the chart below.



Det. Tube Reading, mg/m ³		2.5	5	10	20	30	40	50	60	70	80	90	100	125	175	200
Flowrate Reading	60	-93	-84	-75	-66	-60	-56	-52	-49	-47	-45	-43	-42	-38	-33	-31
	55	-92	-83	-74	-65	-58	-54	-51	-48	-45	-44	-42	-40	-36	-31	-29
	50	-90	-81	-72	-62	-56	-52	-49	-46	-44	-42	-40	-38	-34	-29	-27
	45	-88	-79	-70	-60	-54	-50	-47	-44	-41	-39	-38	-36	-32	-26	-24
	40	-86	-77	-68	-58	-52	-47	-44	-41	-39	-36	-35	-33	-29	-23	-21

PASS	FAIL
------	------

Above area marked "Pass" is for high pressure air used for SCBA; with a -65°F limit per CGA Grade D/NFPA 1989. See AirCheck Notebook Instructions for complete range of flowrates and further details.

If your detector tube reading indicates that you have a problem (anything outside of the PASS area in chart above); go through the following checklist; take corrective action; then retake your sample to see if the problem has been corrected. The 2nd test is free. Submit both samples for analysis to Trace's laboratory.

Troubleshooting Checklist

Purification filters/ Depressurized filters	High ambient air temperatures (above 70°F) affect the operating life of the cartridge. Chemicals used in purification filters begin to degrade as soon as they are installed. Is it time to change the filters?
Manual/auto drain or priority valve	If not working properly can be source for excess water and reduce filter life.
Remote fill or hose reel	Long lengths (>25 ft) of hose are notorious for accumulating and retaining water. A short 1-2 minute purge WILL NOT be sufficient. It is best to take sample from a short fill hose (5-10 ft) or directly from containment fill station. - View our resource videos at www.AirCheckLab.com
Recent hydrostat	Bottles must be properly dried after hydrostat and should be immediately pressurized with dry air.
Valves left open	Ambient air can easily have 10,000 - 50,000 ppm of water. Purge sufficiently to remove water accumulated from ambient air.
Sample taken from storage	Take sample from compressor to identify if compressor is producing dry air. If yes, storage banks may contain excess water. Drain and refill with dry air. This may require 2-3 fills to drive off water from inside cylinders. You can request extra detector tubes (\$10 ea) to do several checks for water without doing a complete air sample.
Detector tube cracked	Only the tips of the tube should be broken. If a crack runs down the main body of the tube, results will not be dependable.
Tube fitting wet	If multiple samples are taken consecutively, excess water may pool inside the fitting. Dry fitting between uses.
Other	Keep in mind that 1 milliliter (which is about 20 drops from an eyedropper) in a 1.7 cubic ft cylinder at 4500 psig would be 90 ppm of water vapor. It doesn't take much to fail.

Appendix B:
Personal
Protective Equipment
Inspection Report

**BALTIMORE COUNTY FIRE DEPARTMENT
PERSONAL PROTECTIVE EQUIPMENT SEMI-
ANNUAL INSPECTION FORM**

Name: Kirchner Gene **Career ID:** 410550 **Date:** 6/3/13

Station: 410 **Shift:** V **Inspected by:** Rogers **Last Inspected:**

Instructions: Mark all items **requiring repair or replacement** with an "x" and attach appropriate Form 133 P with explanation of repair or replacement. All items not requiring repair or replacement should be left blank.

<i>HELMET</i>	<i>GLOVES (2 pairs)</i>
<input checked="" type="checkbox"/> clean	<input checked="" type="checkbox"/> clean, no excessive dirt or staining
<input type="checkbox"/> strap, suspension in good condition	<input type="checkbox"/> proper fit, easily put on and removed
<input type="checkbox"/> no blistering, cracking, or dents	<input type="checkbox"/> no tears, embrittlement, or fraying of glove shell
<input type="checkbox"/> mechanical hardware tight and working	<input type="checkbox"/> seams intact and not excessively worn
<input type="checkbox"/> bead trim around brim not loose or worn	<input type="checkbox"/> liners intact and not ripped, torn, or separated
<input type="checkbox"/> reflective trim intact and effective	<input type="checkbox"/> elasticity of cuffs still strong/snug
<input type="checkbox"/> vision through faceshield/goggles not impaired	<input type="checkbox"/> properly marked with ID# and readable
<input type="checkbox"/> impact cap undamaged and secure	<input type="checkbox"/> NFPA tag attached
<input type="checkbox"/> earflaps not ripped, velcro functioning properly	Note: Gloves passed inspection
<input type="checkbox"/> properly marked with ID# and readable	<i>BOOTS - Rubber/Leather (circle one)</i>
<input checked="" type="checkbox"/> personal helmet, type _____	<input checked="" type="checkbox"/> clean
<i>Note: Helmet passed inspection</i>	<input type="checkbox"/> no holes, cracks, tears, discoloration
<i>HOOD (2 each)</i>	<input type="checkbox"/> inside linings clean and mildew free
<input checked="" type="checkbox"/> clean, no excessive staining	<input checked="" type="checkbox"/> lugs on soles not excessively worn
<input type="checkbox"/> no tears, embrittlement, or fraying	<input type="checkbox"/> no charring or delamination of seams
<input type="checkbox"/> material not excessively stretched or worn	<input type="checkbox"/> properly marked with ID# and readable
<input type="checkbox"/> properly marked with ID# and readable	Non-serviceable worn soles
Note: Hood passed inspection	<i>TURNOUT PANTS</i>
<i>TURNOUT COAT</i>	<input checked="" type="checkbox"/> clean, no excessive staining
<input checked="" type="checkbox"/> clean, no excessive staining	<input type="checkbox"/> proper fit, fasteners closed, no binding or pinching
<input type="checkbox"/> proper fit, fasteners closed, no binding or pinching	<input checked="" type="checkbox"/> no tears, embrittlement, or fraying
<input checked="" type="checkbox"/> no tears, embrittlement, or fraying	<input checked="" type="checkbox"/> seams intact and not excessively worn
<input checked="" type="checkbox"/> seams intact and not excessively worn	<input type="checkbox"/> reflective trim intact and still effective
<input type="checkbox"/> reflective trim intact and still effective	<input type="checkbox"/> pockets and knee pads intact, not excessively worn
<input type="checkbox"/> pockets and elbow pads intact, not excessively worn	<input type="checkbox"/> pants cuffs not fraying
<input checked="" type="checkbox"/> sleeve cuffs not fraying	<input type="checkbox"/> color change in fabric, check material strength
<input type="checkbox"/> color change in fabric, check material strength	<input type="checkbox"/> properly marked with ID# and readable

<input type="checkbox"/> properly marked with ID# and readable	<input type="checkbox"/> suspenders attached
<input type="checkbox"/> wristlets intact	Note: Pants non-serviceable after being cut off by Medics
Note: Coat non-serviceable damaged cuff	POCKET ONE-WAY MASK
PAT TAGS/FIRE DEPARTMENT ID CARD	<input type="checkbox"/> case not damaged
<input type="checkbox"/> proper color based on certification	<input type="checkbox"/> clean, no cracks or tears
<input type="checkbox"/> no rips or tears	<input type="checkbox"/> One-way valve functional
<input type="checkbox"/> hardware functioning	<input type="checkbox"/> ID# readable
<input type="checkbox"/> ID# and picture visible	<input type="checkbox"/> N-95 mask
SAFETY GLASSES	FACEPIECE/BAG
<input type="checkbox"/> vision through lenses not impaired	<input checked="" type="checkbox"/> lens is clear, undamaged
<input type="checkbox"/> frames and chums intact and functioning	<input checked="" type="checkbox"/> all components are accounted for, undamaged
	<input type="checkbox"/> Kevlar headnet, hardware provides face seal
GEAR BAG	<input type="checkbox"/> clean and disinfected, properly identified
<input type="checkbox"/> intact	<input type="checkbox"/> bag intact and properly identified
<input type="checkbox"/> zippers work	<input type="checkbox"/> voicemitter/batteries operational
<input type="checkbox"/> clean	Note: Exhalation Valve and voicemitter was separated from face piece otherwise facepiece was serviceable.
<input type="checkbox"/> properly marked with name and ID#	

Copies: Station File, B.C. File

Form 35 (Revised 11/2010)

Appendix C-1:
Tactical 01
Positive Pressure
Ventilation

S.O.P. #: TACTICAL OPERATIONS MANUAL #01

SUBJECT: POSITIVE PRESSURE VENTILATION

DIVISION: EMERGENCY OPERATIONS

Objective: To facilitate the rapid and systematic removal of smoke and gases from structures during firefighting operations, utilizing the concepts of positive pressure ventilation.

Section 1: Equipment Needed

A. Gas Powered Positive Pressure Fan

1. 21" Power Blower, 4-cycle engine, 7890+ cubic feet/minute (cfm) output.

B. Electric Powered Smoke Ejectors

1. 16", 20", 24"

Section 2: Applicable Structures

Positive Pressure Ventilation may be utilized on, but is not limited to, the following:

- A. Single and Multiple Family Dwellings
- B. Apartment Buildings
- C. Hi-Rise Buildings
- D. Malls
- E. Windowless Buildings
- F. Basements
- G. Attics
- H. Strip Stores

Section 3: General Information

- A. Positive pressure ventilation is simply another tactic for the Company Commander to consider using on the fireground. Positive pressure ventilation is most successful when used on a confined space fire and, therefore, is not applicable on every fireground incident.
- B. The establishment of a fireground ventilation officer, familiar with the principles and practices of positive pressure techniques, should take place in the initial suppression operation. As with any ventilation practice, effective communication is paramount in effectively implementing positive pressure ventilation.
- C. Positive pressure ventilation is MOST effective when ONE firefighter, along with the Officer in Charge, is allowed to implement and control the ventilation operation.
- D. When implementing the positive pressure ventilation technique, regulation of the size of the discharge opening is very important, as this will control the interior pressure of the structure, resulting in increased efficiency of the operation. This can be accomplished by utilizing only the top portion of a window, having a sliding or overhead door open only 1/4 of the way, etc. The more interior pressure created, the quicker the operation will remove smoke. It is important to remember to pressurize from the windward side of the structure, and exhaust to the leeward side, especially on strong windy days (when possible).

- E. When implementing the positive pressure ventilation technique, the use of multiple fans may be indicated for a more efficient operation. Positive pressure ventilation can be used in a series or pressure mode, or side-by-side in the parallel or volume mode. If you have two fans of different sizes, place the larger fan in front of the smaller fan because of its higher cubic feet per minute (cfm) output and the smaller fan behind to maintain the seal. The front fan is placed 2-3 feet from the opening; the back fan 5-6 feet to maintain the seal.
- F. When using windows as discharge points in the operation, be sure to remove any screens that may be present. Removing screens will increase the airflow by 30%-40%. Also, remember to either remove or tie back curtains.
- G. Positive pressure ventilation is NOT to be used in suspected backdraft situations.
- H. When encountering large loading dock doors, close down the doors 1/2 way to lessen the opening.
- I. Positive pressure ventilation must not be started until you are ready to attack the fire within approximately 15 seconds. Then start the blower, making sure you have an exhaust opening.

Section 4: Specific Applications

A. Single Family Dwellings - One story

1. Place fan 5-6 feet away from door opening so as to have the entire door area sealed in a "cone" fashion. (See Figure 1.) Check for proper placement by feeling around the opening with a bare hand for air flow.

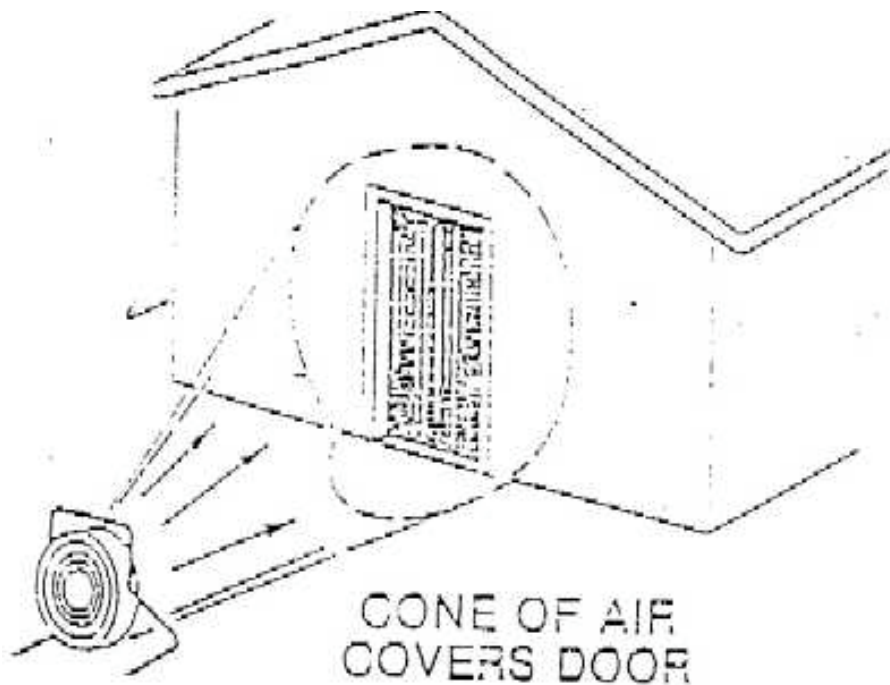


FIGURE 1

2. Have a single discharge opening to the outside, either a door, window or a forced opening, on the opposite side of the structure to create a "single" pathway of air flow from one end of the structure to the opposite end following the natural flow of air, if possible. (See Figure 2.)

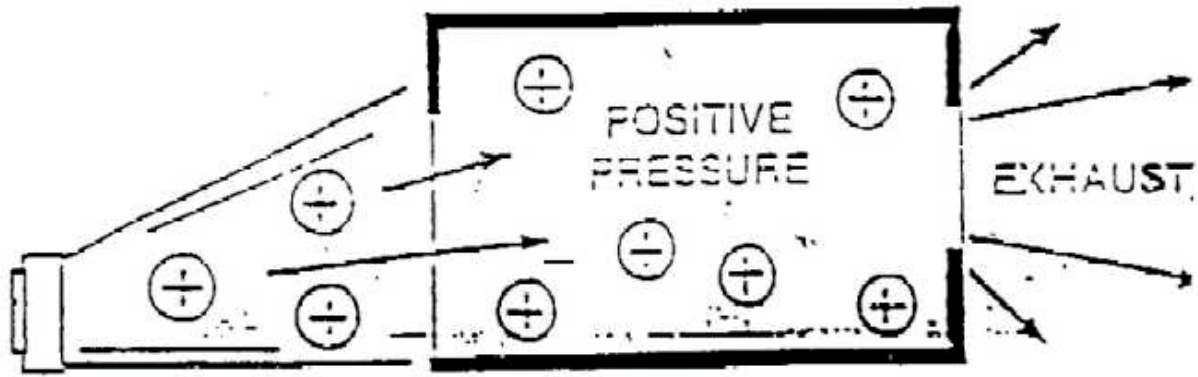


FIGURE 2

3. In the event that numerous windows have been removed during suppression efforts, PPV can still be accomplished by compartmentalizing individual rooms or areas by opening and closing individual doors as necessary. (See Figure 3.)

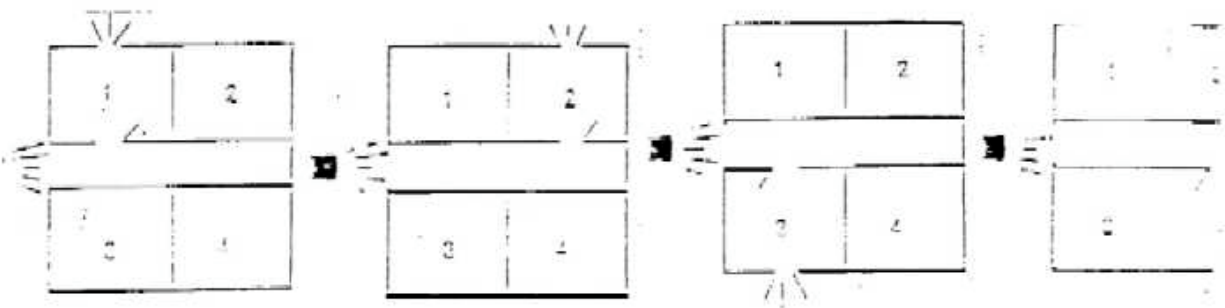


FIGURE 3

B. Single Family Dwelling - Multiple stories

1. Clear the first floor as would be done with a single-story dwelling, making sure all openings are closed on the floors above.
2. After ventilating the first floor, close the discharge opening on this floor thereby forcing the air flow upward into the second floor and out the airflow opening.

C. Basements

1. No exterior openings - utilizing two fans
 - a. Position one fan at the top of stairway leading to the basement, blowing down into basement. This fan can be a 16" electric to alleviate carbon monoxide fumes which are generated by the gasoline powered fans.
 - 1) Do not seal the opening.
 - 2) Place fan close to the door forcing air through the bottom half of the doorway. As air is forced in, smoke is forced out of the top half of the door.
 - b. Utilizing the second fan, the building should then be pressurized, as usual, making sure the air current moves across the basement entrance with the discharge opening to the outside on the opposite side.
 - c. As smoke is forced from the basement by the first fan to the ground floor, it is discharged outside by the second fan. (See Figure 4.)

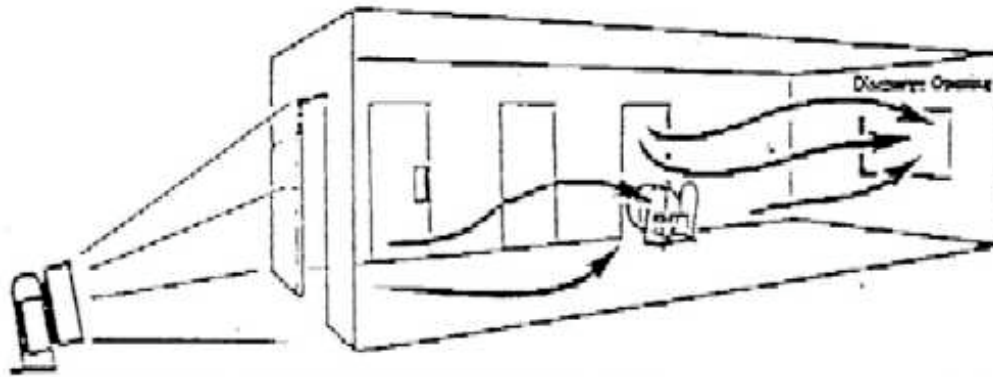


FIGURE 4

2. Existing basement openings
 - a. Close the first floor opening from basement to eliminate smoke travel to remaining floor areas.
 - b. Following the same principles as in single-story dwellings, pressurizing the area for smoke removal.
 - 1) Pressurize, following the same procedure for "BASEMENTS--NO EXTERIOR OPENINGS".
 - 2) Place fan at basement opening on floor above the basement, pressurizing basement in this manner.
 - 3) The 4-cycle PPV blower must not be layed horizontal, as the oil will not lubricate the blower.

D. Attics

1. Before beginning to clear the attic, clear the area of the building likely to receive the most smoke damage from opening the hatch or door to the attic.
2. Utilizing existing entrance to attic, seal opening in a cone fashion.
3. Utilize existing openings in attic, such as louvers or turbines, or, if indicated, a ventilation hole cut in the roof to exhaust smoke from the attic.
4. In the absence of any openings from the attic to the outside, follow the same procedure as for basements without an opening.
5. Be aware of any roof operations, as conditions during fire attack should be monitored.

E. Strip Stores

1. Follow guidelines for single story dwelling.
2. Next, move to the farthest occupancy where smoke is entering and exhaust that occupancy.
3. After the occupancy is clear, close the discharge opening thereby pressurizing the area and limiting smoke spread.
4. Continue the procedure to occupancies on both sides of involved occupancy, pressurizing until the space is clear and the source area is clear.
5. Additional fans may be set up in other areas to expedite building clearing.
6. Positive pressure ventilation fans may also be set up on either side of the involved structure to reduce smoke spread. (See Figure 5)
7. Check in void spaces above drop ceilings for fire extension.

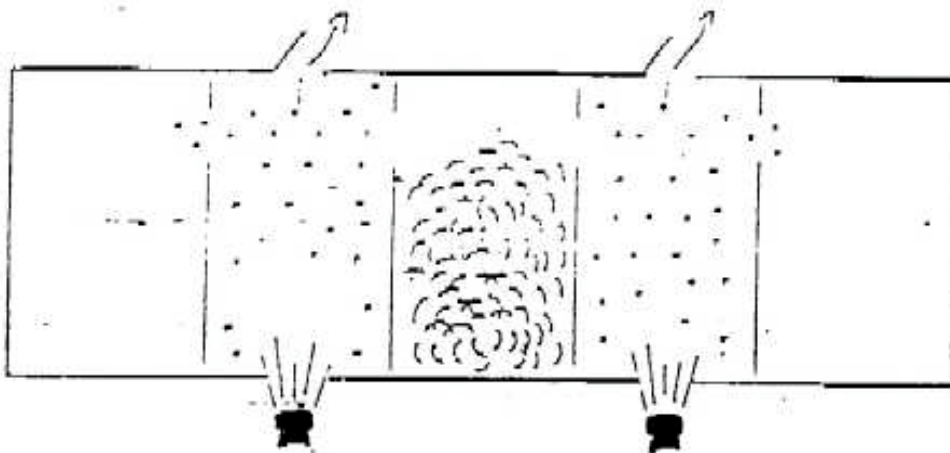


FIGURE 5

F. Multi-Story Buildings, Highrise Buildings, Windowless Buildings

1. Locate the enclosed stairwell having roof access. If smoke is encountered in that stairwell, a firefighter should be sent to the top of the stairwell, closing all doors that are not already closed on the way up. This firefighter should have S.C.B.A., a spare bottle, and portable radio.
2. Next, pressurize the stairwell with the PPV fan augmenting the natural upward draft created when the top and bottom of the stairwell are opened.
3. Positive pressure fans should be used in a series or in an in-line mode; the first fan 5-6 feet from doorway and the second fan 2-3 feet in front of the first fan, to assist in pressurizing the stairwell. (See Figure 6.)

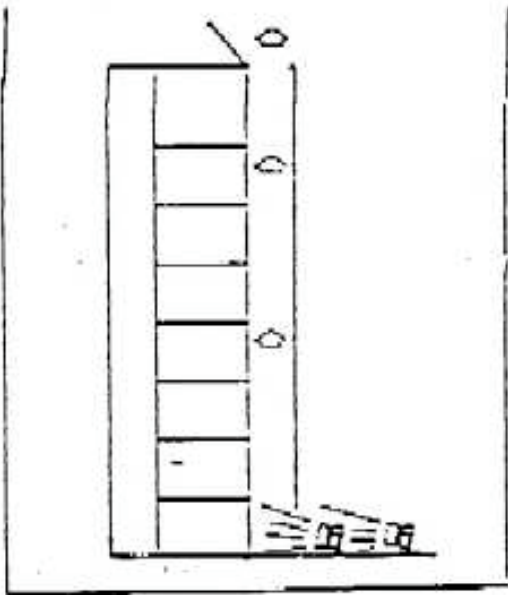


FIGURE 6

4. After the stairwell is cleared, removal of smoke from each floor is started, ventilating the lowest involved floor first and working up to the highest floor of contamination.

5. Ventilate each floor by providing a discharge opening, such as a window or door, on each floor. An opposite stairwell can also be used, utilizing the stairwell that has the roof access for the discharge. (See Figure 7.)

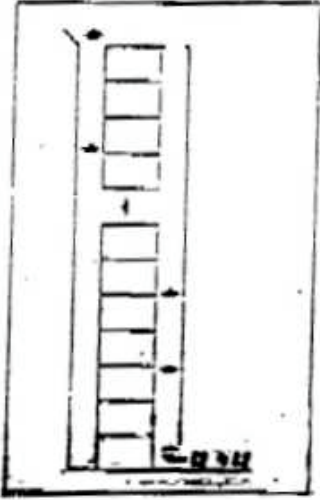


FIGURE 7

6. To facilitate a quicker discharge of smoke, incorporate both stairwells, utilizing one stairwell to provide fresh replacement air, and the other stairwell to serve as a "chimney" to remove smoke and fire gases. (See Figure 8.)

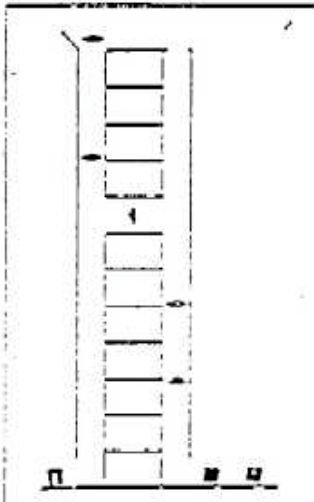


FIGURE 8

7. Elevator shafts can be used if they have a roof and floor access opening.

8. Pressurized Stairwell Towers

- a. Smokeproof Enclosure Ventilation Systems are being incorporated into new Hi-Rise Construction as well as new Mid-Rise Construction. These enclosure systems are independent of the other building ventilation systems. The equipment and ductwork are located within the smokeproof enclosure with intake or exhaust directly from and to the outside. This ventilation equipment is activated by smoke detectors installed at each floor level at an approved location at the entrance to the stairwell tower. These stair shafts are provided with a dampered relief opening at the top of the stairwell tower, and supplied with sufficient air to discharge a minimum positive pressure of 2500 cfm through the relief opening, while at the same time maintaining a minimum positive pressure in the stairwell. These systems are designed to operate with all stairway doors closed under maximum anticipated stack effect.
- b. The Company Commander is responsible for being familiar with these types of buildings within their battalions. Preplanning these buildings with these systems is paramount, in order to effectively utilize these systems in suppression operations.
- c. Upon arrival of the initial Company Commander, the following actions should take place:
 - 1) Report to enunciator panel or command center within the building, usually located near the main entrance of the building.
 - 2) Locate the on/off switch(s) on the enunciator panel, turn switch(s) on, activating stairwell(s) pressurization system.
 - 3) In the event you use a stairwell tower for smoke removal from a certain floor or area, make sure that stairwell tower exhaust system is shut off. If not, you will be fighting the system and unable to exhaust the smoke into this opening.

9. If the building in question is more than 15 stories, an additional fan placed in the intake stairwell blowing into the floor being cleared may be necessary. (See Figure 9.)

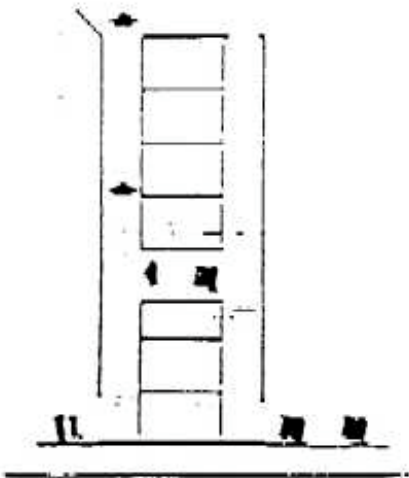


FIGURE 9

10. You may wish to create a pressurized stairwell for emergency evacuation of personnel.

G. Apartment Complexes

1. Open Common Stairwells - Place fan 3-5 feet outside of main entrance of common entrance to facilitate removal of smoke and gases from this area thereby controlling stairwell access and egress for firefighters and occupants.
2. Enclosed Common Stairwells
 - a. Company Commanders must make a decision as to what they feel is a prudent manner in which to proceed in ventilating these areas. Initial placement of the fan 3-5 feet outside of main entrance is still indicated as the intake area for replacement air.
 - b. The discharge area is provided by one of the following:
 - 1) Exhaust the smoke from stairwell through the involved apartment.
 - 2) Exhaust the smoke from stairwell through an uninvolved apartment.
 - 3) Remove the glass at the uppermost landing of the stairway thereby exhausting smoke.

Note: Extreme caution must be exercised to prevent injuries to firefighters and civilian personnel from falling glass.
 - 4) Establish a ventilation hole in the roof immediately above the stairwell, followed by opening the scuttle hatch in the stairwell and exhausting the smoke through these openings.
3. Additional fans should then be placed 3-5 feet outside of involved apartment and proceed as if a single-story dwelling.
4. Additional fans may be deployed for smoke removal at the other individual apartments.

H. Malls

1. If an individual store is involved, proceed as if a "Strip Store."
2. In ventilating a large area, secure a single opening and discharge point. Augment the procedure by incorporating several fans at doorway opening, either in-line or parallel, as well as fans strategically placed throughout common areas to boost internal pressure and thereby increase cfm.
3. Utilize internal HVAC equipment, if possible, keeping in mind the possibility of heat and smoke spread in using this equipment.

I. Utilization in Aircraft Emergencies

1. Position fan at point of aircraft to be entered.
 - a. Front most entrance of aircraft, usually passenger entrance.

- b. Over wing emergency exits. (See figure 10.)

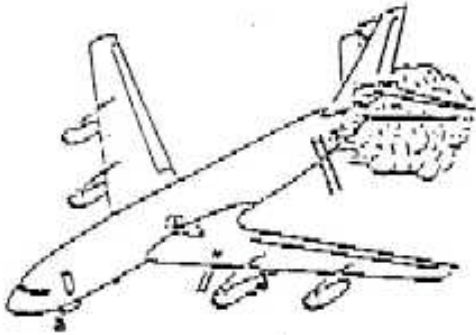


FIGURE 10

- c. Rear entrance where food service loads.
2. Hard to reach entry points.
- a. Hang fan on "A" frame ladder for extra height. (See figure 11.)

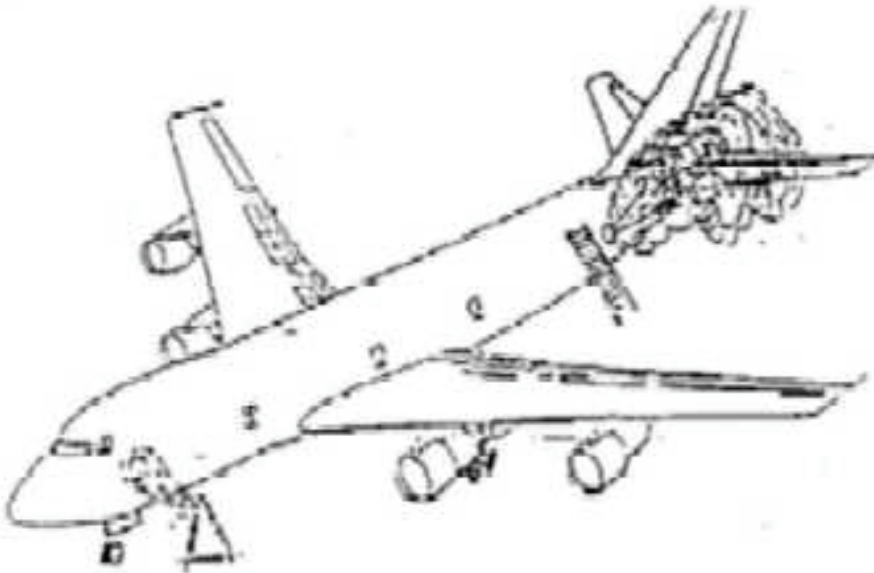


Figure 11

- b. Place fan on mobile stairwell and move into position. (See figure 12.)

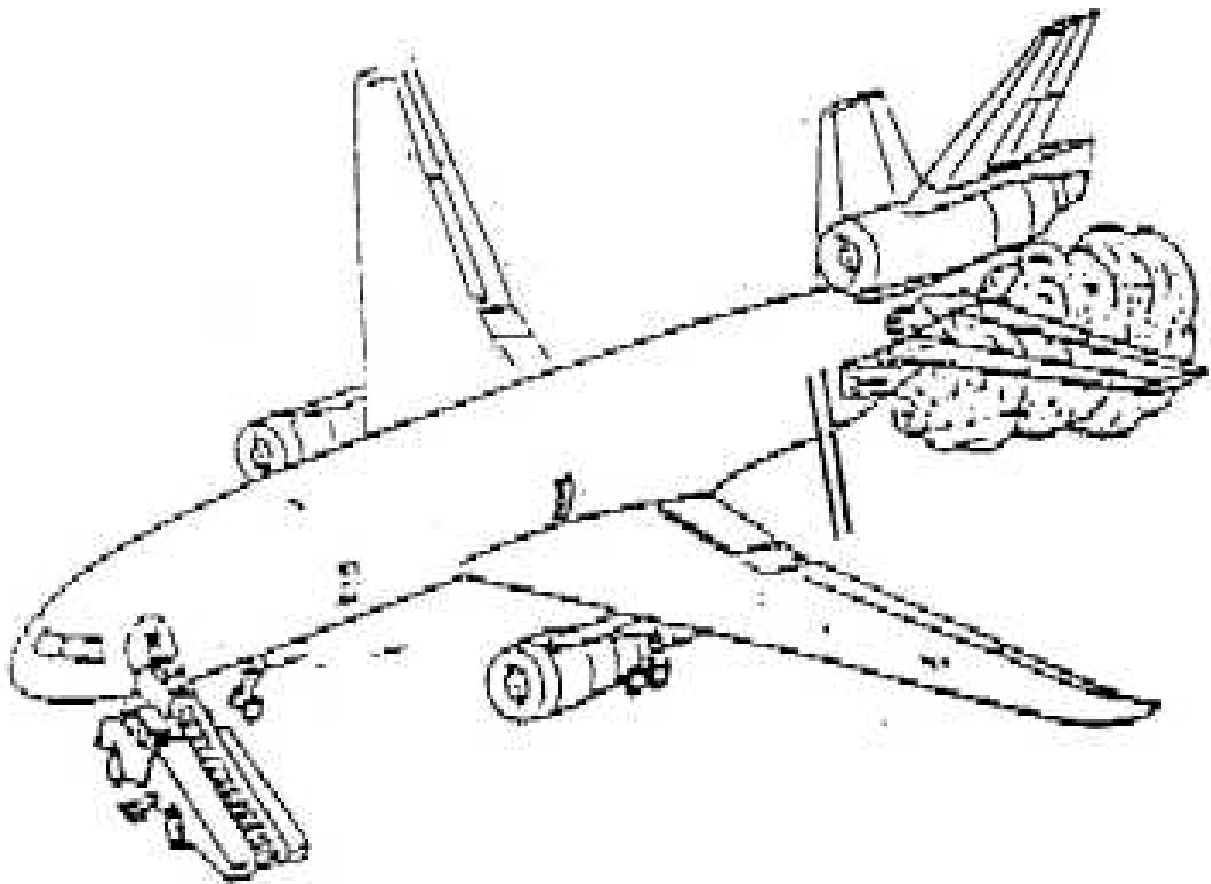


Figure 12

Appendix C-2:
Tactical 06
Personnel
Accountability
System

S.O.P. #: TACTICAL OPERATIONS MANUAL #06

SUBJECT: PERSONNEL ACCOUNTABILITY SYSTEM

DIVISION: EMERGENCY OPERATIONS

Purpose: To establish a personnel tracking system on all incidents.

Section 1: Responsibility

- A. At all times, supervisors are responsible to account for any person who is under this command.
- B. At all times, personnel are to keep their supervisors informed as to their whereabouts or assignments.
- C. The Safety Officer along with the Incident Commander shall be responsible to see that the Personnel Accountability System is in place.
 1. On all rescues and on multiple company incidents where SCBA is in use and/or more than one hand line is deployed the Incident Commander shall designate a Safety Officer.
 - a. The Incident Commander and designated Safety Officer shall verify that a formal Command Post and Command Board are established.
 - b. At the termination of the incident, the designated Safety Officer shall complete a Safety Officer Incident Report and forward it to the Safety Office unless there is a Department Safety Officer on the scene.
 - c. Upon the arrival of a Department Safety Officer the Incident Commander should consider utilizing the designated Safety Officer as an aide at the Command Post for continued personnel accountability.

Section 2: System Components and Definitions

- A. Personnel Accountability Tag (PAT) – a laminated identification card that has a snap ring hook and includes the name, ID number, and photograph.
 - B. Apparatus Collector Ring – consists of a large ring with a unit identification tag attached. Size as follows: 5”x3,” Colors: Engines – blue, Trucks – red, Medics – yellow, Squads/Floodlights – green, Brush Units – black, Division/Battalion Chief and Staff – white, Special Units – burnt orange, Utility Trucks – white.
 - C. Officer Collector Ring – consists of a small ring with unit identification attached. Size 1-1/2”x3.” Colors same as above.
 - D. Accountability Control Board – a device used to record unit/crew/personnel assignments during any Level II accountability situation as directed by the Incident Commander.
 - E. Staff Collector Ring – consists of a large ring with an identification tag marked “STAFF.” It is utilized for all staff and support personnel operating in an incident.
 - F. Point of Entry Control Ring – consists of a large ring with an identification tag attached.
 - G. Makeup Unit Ring – consists of a large ring with a blank unit identification tag. It is utilized with mutual aid companies or other personnel who do not have a PAT.
 - H. Level I Accountability – the minimum level of accountability used during fire and rescue incidents.
-

- I. Level II Accountability – used when it has been determined that the incident requires more stringent accountability. When implemented, “Point of Entry Control” will be established. Examples would include high rise fires, confined space or trench rescues, hazardous materials incidents, etc.
- J. Personnel Accountability Report (PAR) – a physical check of personnel working on an incident performed by their supervisor and reported to the Incident Commander via the organizational framework in place at the time it is taken.
- K. Pre-Emergency Response Training (P.E.R.T.) – includes successful completion of Sessions 1-20 of Firefighter I 1001 Program, Haz Mat Operations, or HazMat Competency, CPR, Bloodborne Pathogens, Medical Clearance and Fit Test.
- L. Personnel Tag Colors – Tags that denote entry or non-entry personnel.
1. White: Minimum Firefighter I, Haz Mat Operations, or HazMat Core Competency, CPR, and Bloodborne Pathogens, as well as completed medical surveillance and FIT testing.
ENTRY PERSONNEL
 2. Pink: Completion of Sessions 1-20 of Firefighter I plus Haz Mat Operations, or HazMat Core Competency, Medical Clearance, Fit Test, CPR, and Bloodborne Pathogens (P.E.R.T.), *or personnel who choose to have facial hair that will interfere with the seal of SCBA facepiece (ex: beards, goatee, etc.)*.
NON-ENTRY PERSONNEL
 3. Blue: Completion of EMR or EMT-B or CRT or EMT-P, and Haz Mat Operations or HazMat Core Competency.
NON-ENTRY PERSONNEL
 4. Brown: Non-entry, Rehab unit members and Medical Directors, observers.
NON-ENTRY PERSONNEL
- M. Personnel Tag Information
1. White, Blue and Brown non-essential tags will contain the member’s name (Last, First, MI), County ID number with bar code, and picture ID.
 2. Pink tags will contain the member’s name (Last, First, MI), County ID number with bar code.
 3. Brown tags (non entry) Re Hab and Medical Directors will contain the member’s name (Last, First, MI) County ID number with bar code and picture.
 4. White tags – no markings are for use when a member is waiting for replacement of their issued PAT tags or while riding with a neighboring company. These tags are for short term or incident-specific only. These tags shall have last name and first name, marked by a grease pencil only issued by the Battalion/Division Chief assigned to that station.

Section 3: Implementation and Compliance

- A. All operational personnel will be issued two (2) PAT's that will be kept with their turnout gear. They will be attached to an existing "D" ring on their turnout coat when not in use.
- B. The PAT shall be considered an issued item of personal protective equipment and will be considered property of the appropriate agency (Baltimore County Fire Department and Baltimore County Volunteer Firemen's Association).
- C. The appropriate PAT will be issued when a member has successfully completed all required training. The Audio Visual Department (AV) will issue tags after sanctioned class then the member will comply with the MFRI Accountability policy. All PAT TAGS issued during training shall be collected at the end of said training.
- D. During recruit or basic training, a temporary PAT will be issued to trainees by the Fire Rescue Academy while at the Academy. If it is a MFRI sanctioned class then the member will comply with the MFRI Accountability policy. All PAT TAGS issued during training shall be collected at the end of said training.
- E. Regular inspection and maintenance of PAT's will be the responsibility of the Company Commander.
- F. If a PAT is lost, misplaced or damaged, the circumstances surrounding the incident will be reported using a Form 58. The report will be taken to AV prior to the making of a replacement tag. A temporary PAT will be issued by the Division/Battalion Chief assigned to that station. Each BC/DC will maintain 5 sets of blank WHITE tags.
- G. Personnel who resign, retire or are terminated from the department or any volunteer company will surrender their PAT's to their Company Commander. The Company Commander will send both tags to AV.

Section 4: Utilization of the Personnel Accountability System

- A. Level I Accountability
 - 1. The unit supervisor shall be responsible for all personnel riding on the apparatus and verifying that the proper PAT's are on the Apparatus Collector Ring. He/she will retain the Officer Collector Ring.
 - 2. All personnel who may become involved in any tactical operation will give their second PAT to the unit supervisor. The unit supervisor will place them on the Officer Collector Ring.
 - 3. Only those personnel who will function as part of a company will place their PAT's on that unit's Officer Collector Ring. For example: the driver operator who remains with the unit would keep the tag with him/her.
 - 4. The Apparatus Collector Ring will remain on the unit unless otherwise directed by the IC or the Safety Officer.
 - 5. Staff personnel reporting to Command must:
 - a. Report to the IC
 - b. Place PAT on Staff Collector Ring
 - c. Await assignment
 - d. Have second PAT available for tactical assignment
 - 6. Individuals in charge of medic crews will retain the Officer Collector Ring.

B. Level II Accountability

1. When the IC or the Safety Officer determines that the incident requires more stringent accountability, he/she will implement "Point of Entry Control" utilizing the Accountability Control Board.
2. To implement "Point of Entry Control," the designated member(s) will monitor all points of entry into the structure, confined space, haz mat hot zone, dive operation, trench collapse or any other areas deemed necessary. Members assigned this function shall assume the radio designation "Entry Control."
3. "Entry Control" shall record:
 - a. each member's name
 - b. the company number
 - c. time of entry
 - d. assignment
 - e. beginning air pressure on any breathing apparatus
4. As members exit a control point, the Officer SHALL report to the control entry Officer to retrieve company pat tags. Members who must exit at a point remote from the control point shall inform "Entry Control" of their exit immediately.

C. When to conduct a "PAR"

1. Any time that an evacuation/tactical withdrawal is ordered.
2. Whenever the strategy of the incident is changed.
3. At the discretion of the Incident Commander or the Safety Officer.
4. When reporting "PAR," division or group supervisors will report companies under their command.
Example: Division 3 is PAR for E-1, E-2, and TK-1.

D. When a company fails to report "PAR"

1. Officer shall, via radio, report to the IC that they are not PAR (ex: Engine 3 to Command, I am not PAR).
2. The IC shall state the following transmission over all tactical talkgroups: "COMMAND TO ALL UNITS, COMMAND TO ALL UNITS, ENGINE 3'S CREW IS TO REPORT TO ANY OFFICER ON THE INCIDENT IMMEDIATELY."

NOTE: Continue PAR of other companies while trying to locate the missing crew member(s).

3. All Officers shall immediately report to the IC the member(s) name that reports to them (ex: Engine 2 to Command, I have FF Jones from Engine 3's crew with me).
4. The IC, after receiving this information and verifying all crew members are accounted for, shall report via radio the following transmission: "COMMAND TO ALL UNITS, COMMAND TO ALL UNITS, ENGINE 3 IS NOW PAR."
5. If, after #2 above, either the crew or member(s) are not accounted for, the following shall take place: "COMMAND TO ALL UNITS, COMMAND TO ALL UNITS, ENGINE 3'S CREW (OR FF SMITH FROM ENGINE 3) HAS NOT REPORTED PAR. ANYONE KNOWING THEIR (OR HIS) LAST LOCATION CONTACT COMMAND IMMEDIATELY."

6. Depending on the information received on the last location of the missing member, the RIT Team may be deployed.

THE PAR SHALL BE MADE IN ACCORDANCE WITH THE UNITY OF COMMAND PRINCIPLES.

BALTIMORE COUNTY FIRE SERVICES
P.A.T. TAG APPLICATION

PLEASE PRINT CLEARLY AND LEGIBLY
OR WE WILL NOT BE ABLE TO MAKE YOUR TAGS

NAME - LAST FIRST M.I.

ID NUMBER - STATION NUMBER -
LOSAP

CERTIFICATIONS
CHECK ONLY ONE

NEW MEMBER (BROWN)
COFFEE WAGON OR FIRE SURGEONS
NON-ENTRY

FF I COMPLETE (WHITE)
FFI COMPLETED, HAZ-MAT OPS, CPR
OR HAZ-MAT CORE
COMPETENCIES, BLOODBORNE
MEDICAL, MEDICAL CLEARANCE &
SUCCESSFUL FIT TEST
ENTRY

MEMBER MEETING PERT (PINK)
1-20 OF FF I Plus HAZ-MAT OPS OR CORE COMPETENCIES
CPR & BLOODBORNE (PERT) MEDICAL CLEARANCE
SUCCESSFUL FIT TEST

EMERGENCY MEDICAL SERVICES
EMR, EMT-B, EMT-I OR EMT-P & HAZ-MAT
OPS OR HAZ-MAT CORE COMPETENCIES
NON-ENTRY

NOTE: Copies of all current certifications to include the fit test record must be attached to this form at time of submission to the Officer In Charge of the Fire Academy.

CERTIFICATIONS PROVIDED

Firefighter (level) - Date -

E.M.S. (level) - Date -

Haz-Mat Operation (date) _____

Haz-Mat Core Competencies (date) - _____

Bloodborne Path (date) _____

Medical Clearance (date) _____

Fit Testing Documentation (date) - _____

Senior Company Officer Signature - _____

Tags Approved By: - Date -

Tags Made By: - Date -

Revision 9-2012

Appendix C-3:
Tactical 07
Incident Command
System

S.O.P.#: TACTICAL OPERATIONS
MANUAL #07 SUBJECT: INCIDENT COMMAND
SYSTEM DIVISION: EMERGENCY OPERATIONS

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Objective: The purpose of this SOP is to define the basic incident command system. For complex incidents, the Field Operations Guide, ICS 420-1, should be used as a reference.

SECTION 1: COMMAND

1.1 Purpose

Fire Departments respond to a wide range of emergency incidents. This procedure guide identifies standard operating procedures that can be employed in establishing command. A strong command presence will prevent freelancing. The system provides for the effective management of personnel and resources providing for the safety and welfare of the personnel. It also establishes procedures for the implementation of all components of the Incident Command System (ICS).

Command Procedures are designed to:

1. Fix the responsibility for Command on a specific individual through a standard identification system, depending on the arrival sequence of members, companies and chief officers.
2. Ensure that a strong, direct, and visible Command will be established from the onset of the incident.
3. Establish an effective incident organization defining the activities and responsibilities assigned to the Incident Commander (IC) and to other individuals operating within the ICS.
4. Provide a system to process information to support incident management, planning and decision-making.
5. Provide a system for the orderly transfer of command to subsequent arriving officers.

1.2 Functions of Command

The Functions of Command include:

1. Assume and announce Command and establishing an effective operating position (Command Post).
2. Rapidly evaluate the situation (size up).
3. Initiate, maintain, and control the communication process.
4. Identify the overall strategy, develop an incident action plan, assign companies and personnel consistent with plans and standard operating procedures.
5. Develop an effective Incident Management Organization.
6. Provide tactical objectives.
7. Review, evaluate and revise the Incident Action Plan (IAP).
8. Provide for the continuity, transfer and termination of Command.

The IC is responsible for all of these functions. As Command is transferred, so is the responsibility for these functions. The first five (5) functions MUST be addressed immediately from the initial assumption of Command.

1.3 3 Size-up

A size-up system is a vital and necessary tool for Incident Commanders as their need to make decisions varies with the dynamics of the incident.

A size up includes a 360-degree view of the building. For large buildings, you can have side Charlie give the report.

For homes, row houses, and town houses, identification of a basement is crucial.

For apartments, a person hanging on balconies is important information.

The following 5-point Size-Up system shall be utilized when operating at an incident:

1. FACTS (Facts that the situation presents)
 - a. Time of the incident
 - b. Location of the incident
 - c. Nature of the incident
 - d. Life hazards

- e. Exposures
 - f. Buildings, areas involved
 - g. Weather
2. Probabilities (Predictions based upon the existing situation)
 - a. Life hazards
 - b. Extent of the incident
 - c. Explosion potential
 - d. Collapse potential
 - e. Weather changes
 3. Own Situations (Your resources and capabilities)
 - a. Personnel and equipment on scene
 - b. Availability of additional resources
 - c. Available water supply
 - d. Appropriate strategic mode
 - e. Actions already taken
 4. Develop incident action plan (Result of your analysis of items 1,2, & 3)
 - a. Determine strategy
 - b. Evaluate tactical options.
 - c. Select tactics.
 5. Implement Incident Action Plan
 - a. Issue tactical assignments
 - b. Coordinate activities.
 - c. Evaluate results.
 - d. Evaluate results.
 - e. Alter activities as necessary.

1.4 Brief Initial Report

The primary role of the 1st arriving Incident Commander is to establish strategy and tactics. The primary role of the additional responding units is to support the Incident Commander's strategy and tactics by accomplishing specifically assigned tactical objectives. In order for this cooperation to work effectively it is important for the support units to have as close an idea as to what is occurring, as does the Incident Commander. Therefore, the Incident Commander must act as the "TV camera" for the other units. His or her initial report of the situation must be concise, complete, and accurate. A Brief Initial Report (BIR) shall be required on any and all incidents involving a response of multiple units regardless of the type of unit.

The following elements, in the specific order listed, shall be included in the initial report of any and all incidents when such reports are required:

1. Unit ID "arrived."
2. Location of unit in relation to the overall incident (i.e. Side Alpha, Bravo, Charlie, Delta)
3. Description of the Fire situation.
4. Describe the action you are taking.
5. Address the Command function. (Rank, name will be command)

Nothing evident example: Engine 451 arrived; side Alpha of a 1½ story dwelling; nothing evident. Firefighter Jones on Engine 451 has York Road Command.

Fire showing example: Engine 5 arrived; side Alpha of a 2 ½ story wood frame dwelling. We have fire showing from 2 rooms on the second floor. Engine 5 has laid a supply line from Wilkens Ave, and we will be making an interior attack with a hand line. Lt. Smith of Engine 5 has Wilkens Avenue Command.

Limited command example: E301 arrived; side Charlie of a 3 story garden apartment. We have fire showing from the 2nd floor and people hanging off the balcony. Give me a second alarm. Captain Curtis has Limited Command.

Working fire – offensive mode example: Engine 11 arrived, side Alpha, we have a large two story school with a working fire on the 2nd floor. Engine 11 is laying a supply line and taking a hand line to the second floor for search and rescue. Captain Smith of Engine 11 will be 7th Street Command.

Working fire – defensive mode: Engine 1 arrived; side Alpha with a working fire. We have a 50 by 75 warehouse fully involved with serious exposure on side Delta. Engine 1 is laying a supply line and attacking the fire with a master stream. We will be advancing a hand line into exposure Delta for search, rescue and fire attack. Lieutenant Jones of Engine 1 will be Buckeye Command.

EMS incident example: Truck 1 arrived with a multi-vehicle accident. Give me an ALS Strike Team, Lieutenant Morris of Truck 1 will be Parkway Command.

Single company incident example: Engine 6 arrived; we have a dumpster fire with no exposures. Engine 6 can handle.

The radio designation “Command” will be used along with the geographical location of the incident (i.e., “7th Street Command”, Metro Center Command).

1.5 Establishing Command

1. The first unit or member on the scene must initiate whatever parts of the Incident Command System are needed to effectively manage the incident scene. The initial Incident Commander shall remain in command until command is transferred or the incident is stabilized and terminated.
2. The first arriving fire department unit activates the command process by giving a Brief Initial Report (BIR).
3. A single company incident (trash fires, single patient E.M.S. incidents, etc.) may only require that Company or unit acknowledge their arrival on the scene.
4. Upon arrival of a higher-ranking officer, they will be briefed by the on-scene Incident Commander. The higher-ranking officer will then assume Command. This transfer of command is to be announced and a Progress Report given. The new Incident Commander will reassign the officer being relieved of command responsibilities.
 - a. The Command Post should be in a position where you can see the building.
 - b. The Command Post does not have to be the back of the Chief’s car. It can be the front seat of an engine or truck. The mobile radio is preferred radio for Command.
5. For incidents that require the commitment of multiple companies or units, the first unit or member on the scene must announce “Command” and develop an Incident Command Structure appropriate for the incident.
6. Command Staff: Safety Officer, Public Information Officer, Liaison Officer
 - a. A Safety Officer shall be established as soon as practical. The IC retains the responsibility for Safety until the position is staffed. **Reminder: Safety at the incident is everyone’s responsibility.**
7. The staffing of the General Staff positions is Planning (1st BC after being relieved by DC), Logistics (2nd BC), and Operations (3rd BC). Finance/Admin will be staffed as necessary.
 - a. Appointing an Operations Section Chief does not improve the Span-of Control within Operations.
8. Unified Command will be established when multiple agencies have significant statutory responsibility for management of aspects of the incident or an incident spans multiple jurisdictions.
 - a. A multiple alarm fire within Baltimore County would be a Single Command, even though mutual aide companies were assisting. The incident does not span multiple jurisdictions.
 - b. A house fire where police are assisting with traffic control is also not a situation requiring a Unified Command; a Single Command (fire department) could direct police units as needed

1.6 Transfer of Command

1. Purpose - Transfer of Command refers to the act of one individual relieving another individual of authority, responsibility, and accountability as it pertains to the execution of the function of Command. The progressive change-of-command principle shall be utilized.

An incident commander that is a non-officer shall be relieved as soon as practical by the 1st arriving officer.

- a. The 1st officer to assume Command shall retain Command until formally relieved by a higher-ranking officer.
2. Transfer of Command Procedure
- a. In order of preference, command should be transferred
 1. Face to face
 2. Radio
 3. Assumed by an officer where the original commander cannot be found.
 - b. "Passing Command" to a unit that is not on the scene creates a gap in the command process and compromises incident management. To prevent this "gap", **COMMAND SHALL NOT BE PASSED TO AN OFFICER WHO IS NOT ON THE SCENE**. It is preferable to have the initial arriving Company Officer continue to operate in the "Limited Command" mode until command can be passed to an on-scene Officer.
 - c. Should a situation occur where a later arriving Company or Chief Officer cannot locate or communicate with Command (after several radio attempts), they will assume and announce their assumption of Command and initiate whatever actions are necessary to confirm the safety of the missing crew.
 - d. The individual preparing to assume Command shall, at an appropriate moment, request a status report from the Incident Commander. The status report should include
 1. The current situation.
 2. Any injuries, loss of life, etc.
 3. All current control efforts and the status of those efforts.
 4. The anticipated course of the incident.
 5. The location of on scene resources.
 6. Any other information pertinent to the incident.
 - e. Assumption of command is discretionary for the Fire Chief.

SECTION 2: MODES OF OPERATION

The responsibility of the first arriving unit or member to assume Command of the Incident presents several options, depending on the situation. If a Chief Officer, unit, or member without tactical capabilities (i.e., staff vehicle, no equipment, etc.) initiates Command, the establishment of a Command post should be a top priority. At most incidents the initial IC will be a Company Officer. A Company Officer assuming command has a choice of modes and degrees of personal involvement in the tactical activities, but continues to be fully responsible for the command functions. The initiative and judgment of the Officer are of great importance. The following command options describe the Company Officer's direct involvement in tactical activities and the modes of command that may be utilized while also complying with the Two In - Two Out Policy (Appendix C).

2.1 Nothing Evident Mode

These situations generally require investigation by the initial arriving company while other units remain in a staged mode or take up predetermined positions. The officer should go with the company to investigate while utilizing a portable radio to command the incident.

2.2 Limited Command Mode

Limited command mode is for situations that require immediate action to stabilize and require the Company Officer's assistance and direct involvement in the attack. In these situations, the Company Officer goes with the crew to provide the appropriate level of supervision.

Examples of these situations include:

1. Offensive fire attacks in marginal situation.
2. Critical life safety situation (e.g., rescue) that must be achieved in a compressed time.
3. Any incident where the safety and welfare of firefighters are a major concern.
4. Obvious working incidents that require further investigation by the Company Officer.
5. Where fast intervention is critical.

6. The Limited Command mode should not last more than a few minutes and will end with one of the following:
 - a. Situation is stabilized.
 - b. Situation is not stabilized and the Company Officer must withdraw to the exterior and establish a command post. At some time the Company Officer must decide whether or not to withdraw the remainder of the crew, based on the crew's capabilities and experience, safety issues, and the ability to communicate with the crew. **No crew shall remain in a hazardous area without radio communications capabilities.**
 - c. Command is transferred to another Company Officer. With the exception of high-rise operations, the next arriving engine must assume command. That Company Officer shall establish a formal command post and retain Command until transfer of command to a superior officer.
 - d. Command is transferred to an arriving superior officer. When a Chief Officer is assuming command, the Chief Officer may opt to return to the Company Officer to his/her crew, or assign him/her to a subordinate position.

2.3 Command Mode

Certain incidents, by virtue of their size, complexity, or potential for rapid expansion, require immediate, strong, and direct overall command. In such cases, the Company Officer will initially assume an exterior, safe and effective command position and maintain that position until relieved by a Higher Ranking Officer.

If the Company Officer selects the Command Mode, the following options are available regarding the assignment of the remaining crewmembers:

1. One of the crewmembers will serve as the acting Company Officer. The collective and individual capabilities and experience of the crew will decide this action.
2. The officer may assign the crew members to work under the supervision of another Company Officer. In such cases, the Officer assuming Command must communicate with the Officer of the other company and indicate the assignment of those personnel.
3. The officer may elect to assign the crew members to perform staff functions to assist command.

SECTION 3: ORGANIZATIONAL STRUCTURE

It will be the responsibility of the IC to develop an organizational structure as soon as possible after arrival and implementation of initial tactical control measures. The size and complexity of the organizational structure will be determined by the scope of the emergency.

As an incident escalates the IC should group companies to work in divisions or groups. The use of the term "interior" is inappropriate.

3.1 Divisions

A division is the organizational level having responsibility for operations within a defined geographic area.

Division Naming Conventions:

Structures

1. The exterior walls of any structure shall be designated as **Sides** and shall be identified in order by going clockwise beginning with "**Alpha,**" followed by "**Bravo, Charlie, and Delta.**"
2. Side "Alpha" shall be defined as that side containing the Street Address or the Front of the building.
3. When a supervisor is assigned to manage tactics on a particular side of a structure, he shall be assigned the Division title associated with the corresponding side of the structure, for example Division Alpha.
4. Exposures are named after the side of the involved structure to which it is exposed. Ex: The exposure facing Side Charlie of an involved structure would be identified as Exposure Charlie.
 - a. For structures with multiple exposures on the same side, use B1, B2, B3, etc. for exposures on the Bravo side and D1, D2, D3, etc. for exposures on the Delta side. You can also use the building address.

EXPOSURE E2	EXPOSURE E1	FIRE	EXPOSURE D1	EXPOSURE D2
----------------	----------------	------	----------------	----------------

b. For large exposures, you can establish branches.

5. The interior floor area of a structure shall be identified by its floor number.
6. When a supervisor is assigned to manage tactics on a particular floor, he/she shall be assigned the Division title associated with the corresponding floor number, for example, Division 5.
7. Common names may be used to identify other areas of a structure, for example, mezzanine, roof, garage, and basement. When a supervisor is assigned to manage tactics in that particular area, he/she shall be assigned the Division title associated with that particular area, for example, Mezzanine or Garage.

Open Areas

1. Geographic areas necessary to maintain command and control should be established using natural dividing lines such as roads, creeks, railroad beds, etc. whenever possible.
2. These established areas shall be designated as "Divisions" and shall be identified alphabetically.

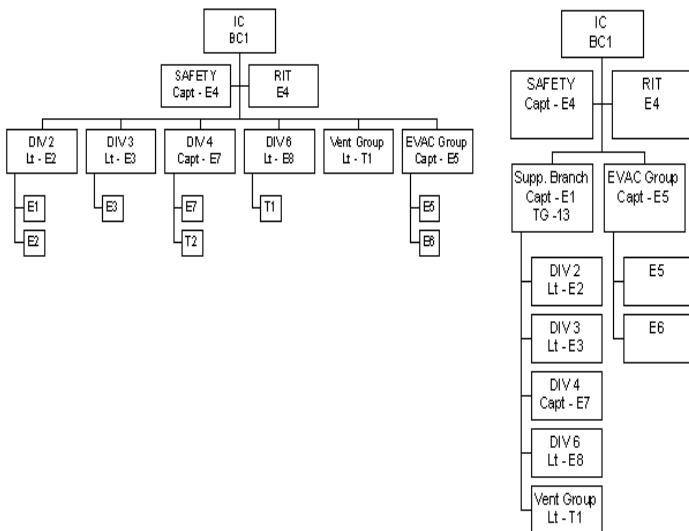
3.2 2 Groups

Groups are assigned Functional Responsibilities at an incident. Examples are Rescue Group, Salvage Group, Search Group, and Vent Group. Groups Supervisors manage their assigned tactics across other established Divisions, and must coordinate the activities of assigned personnel operating within the areas of established Divisions. Accountability for those resources assigned to a Group Supervisor is not transferred to a Division Supervisor.

3.3 Branches

Branches are used when the span of control for groups and/or divisions is exceeded.

Example: Span of control is 6 before. After establishing a branch, the span of control is now 2.



The radio designation of branches should reflect the objective of the Branch when designating functional branches (i.e., Haz-Mat Branch, Medical Branch, etc.) Branches can also be named geographically.

When the IC implements a branch, the division or group supervisors should be notified of their new branch director and what talk group the branch is assigned.

3.4 Basic operational approach to Divisions, Groups, and Branches

1. The safety of firefighting personnel represents the major reason for establishing Divisions or Groups.
 - a. The breaking up of crews should be kept to a minimum.
2. Each division and/or group supervisor must maintain communication with assigned companies to control both their position and function. They must constantly monitor all hazardous situations and risks to personnel. They must also take appropriate action to ensure that companies are operating in a safe and effective manner.
3. The use of Division or Groups in the command organization provides a standard system to divide the incident scene into smaller subordinate management units or areas. The normal span of control is three (3) to seven (7). In fast moving, complex operations, the span-of-control should not exceed five (5).
4. Division or Group responsibilities should be assigned early in the incident, typically to the first company assigned to a geographic area or function.
5. When effective Divisions or Groups have been established, the Incident Commander can concentrate on overall strategy and resource assignment, allowing the Divisions or Groups to manage their assigned units.
6. The Incident Commander will assign each Division or Group:
 - a. Supervisor
 - b. Tactical objectives
 - c. A radio designation (Roof, Division Alpha, Vent Group, etc.)
 - d. The identity of assigned resources to the Division or Group.
7. When the number of Divisions and/or Groups exceeds five, a branch is established that contains the divisions and/or groups.
 - a. Each Branch Director will have his/her own organizational chart, and they will be responsible for the accountability of assigned Divisions and Groups.
8. Divisions and groups reduce the overall amount of radio communications. Most routine communications within a Division or Group should be conducted in a face-to-face manner between Company Officers and their Division or Group. When a PAR is conducted, the Division or Group Supervisor will answer for all the units within his/her division.
9. Divisions and groups are also responsible for communicating needs and progress to Command.
 - a. CAN (Conditions, Actions, and Needs) is used for status reports.
 - b. Command must be advised immediately of significant changes, particularly those involving the ability or inability to complete an objective, any hazardous conditions, accidents, structural collapse, etc.
10. The Division or Group Officer must be in a position to directly supervise and monitor operations. This will require the Division or Group Officer to be equipped with the appropriate protective clothing and equipment for their area of responsibility.
11. Division or Group Officers will be responsible for and in control of all assigned functions within their division or group. This requires each Division or Group Officer to:
 - a. Complete objectives assigned by Command.
 - b. Account for all assigned personnel.
 - c. Ensure that operations are conducted safely.
 - d. Monitor work process. If you are not making any progress, this needs to be reported.
 - e. Request additional resources as needed.
 - f. Redirect activities, as necessary.
 - g. Coordinate actions with related activities, and adjacent Division or Groups.
 - h. Monitor welfare of assigned personnel.
 - i. Provide Command with essential and frequent progress reports.
 - j. Re-allocate resources within the Division or Group.

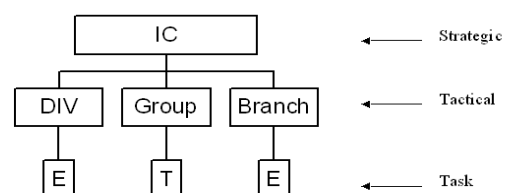
SECTION 4: COMMAND LEVELS

The basic configuration of command includes three levels:

Strategic level—Overall direction of the incident

Tactical level—Assigns operational objectives

Task level—Specific tasks assigned to Companies



4.1 Strategic

The Strategic level involves the overall command of the incident. The IC is responsible for the strategic level of the command structure.

The strategic level responsibilities include:

1. Determining the appropriate strategy
Incident Strategy
Rescue, Exposures, Confinement, Extinguishment, Overhaul, Ventilation, and Salvage (RECE-OVS)
2. Establish overall incident objectives
3. Incident objectives and strategies must always adhere to the **Incident Priorities**
 - a. Life Safety
 - b. Incident Stabilization
 - c. Property Conservation.
4. Develop an Incident Action Plan
 - a. The incident action plan (IAP) should cover all strategic responsibilities, all tactical objectives, and all support activities needed during the entire operational period.
 - b. The IAP defines where and when resources will be assigned to the incident to control the situation.
 - c. The IAP is the basis for developing a command organization, assigning all resources and establishing tactical objectives.
 - d. A Form 365 or Command Chart is required for working fire and complex operations.
 - e. An IAP is required for multiple operational periods.
5. Obtaining and assigning resources
6. Predicting outcomes and planning
 - a. Think ahead of the fire
 - b. Develop a Plan 'B' and a Plan 'C'
7. Assigning specific objectives to tactical level units

As a small incident escalates into a major incident, additional organizational support will be required. The Incident Commander can become quickly overwhelmed and overloaded with information management, assigning companies, filling out and updating the tactical worksheets, planning, forecasting, requesting additional resources, talking on the radio, and fulfilling all the other functions of Command. The immediate need of the Incident Commander is support. As additional ranking officers arrive on the scene, the Command organization may be expanded through the involvement of Officers, staff personnel, and specifically designated companies to fill Command and General Staff Positions.

An IC needs someone to document and track resources and someone to talk on the radio, so he/she can stand back, see the big picture, and focus on making decisions.

If a higher-ranking officer wants to affect a change in the management of an incident, they must first be on the scene of the incident, and then utilize the transfer of command procedure. Anyone can affect a change in incident management in extreme situations relating to safety by notifying the Incident Commander and initiating corrective action.

4.2 Tactical

The Tactical level includes directing operational activities towards specific objectives.

Tactical level officers include branch directors, division supervisors, and group supervisors who are in charge of grouped resources. Tactical level officers are responsible for specific geographic areas or functions, and supervising assigned personnel. A tactical level assignment comes with the authority to make decisions and assignments, within the boundaries of the overall plan and safety conditions. The accumulated achievements of tactical objectives should accomplish the strategy as outlined in the IAP.

4.3 Task

The task level refers to those activities normally accomplished by individual companies or specific personnel. The task level is where the work is actually done. Task level activities should accomplish tactical objectives and are routinely supervised by Company Officers.

SECTION 5: COMMUNICATIONS

5.1 Communication Procedure

Effective incident scene communications is the responsibility of command. Dispatch should be considered an integral part of the Incident Commander's resource pool.

1. The terminology for incident identification shall be left to the discretion of the Incident Commander, but usually corresponds with the incident's location, for example, *Craigmont Road Command*. Caution should be exercised, however, so as not to use identifiers that might not clearly separate one incident from another, *for example, Towson Command*).
2. Face to face communications is always preferable. However, radio communications directed towards and from established functional assignments shall use the **appropriate functional title**.
Example : Communications directed to and from the individual assigned responsibility for all activities on the 1st floor of a structure shall be addressed as **"Division 1."**
3. In order to keep incident scene communications to a minimum, the **"Command by Exception"** principle should be utilized. This means that radio traffic directed to immediate supervisors should be limited as much as possible to:
 - a. Announcing the completion of an assigned objective.
 - b. Announcing when an assigned objective cannot be met.
 - c. Announcing identified safety problems.
 - d. Announcing the need for additional resources to accomplish an assigned objective.
 - e. Announcing other emergency or absolutely necessary information.
4. The Incident Commander shall be responsible for canceling assignments or placing units available.

5.2 Command Restricted Talk Group

Objective: Acknowledging that effective communication is paramount to the safety and effectiveness of emergency scene operations, it is the intent of this policy to provide a mechanism for incident commanders to quickly and efficiently limit and control radio transmissions. When initiated, ALL RADIO TRANSMISSIONS on a Command Restricted Talk Group will be limited to the Incident Commander, the crew(s) actively participating in incident operational activities, and Fire Dispatch. All other radio transmissions will be prohibited.

Rules: Command Restricted Talk Group:

1. At any time during an incident, the Incident Commander may request Fire Dispatch to institute a "Command Restricted Talk Group."
2. Upon the Incident Commander establishing a Command Restricted Talk Group, Fire Dispatch will activate the Alert 3 Tone and announce that Talk Group XX is now "Command Restricted."
3. All radio transmissions on a Command Restricted Talk Group will remain restricted to transmissions by the Incident Commander and or crews involved in critical operations.
4. Fire Dispatch will maintain and monitor the radio restriction and notify any unit making an unauthorized radio transmission on the talk group that the group is Command Restricted, and to move to another talk group.
5. Fire Dispatch will announce the restriction over the Divisional TG associated with the Battalion TG as well as Main 1.
6. Upon dispatching additional equipment to the incident, dispatch will announce the restriction over TG1 at the time of dispatch.
7. The Command Restricted Talk Group will remain restricted until the Incident Commander terminates the restriction, at which time normal radio transmissions may resume on the talk group.
8. If the affected TG is a Divisional TG, the Civilian Shift Supervisor (CSS) and ADO will assign an alternate Divisional TG and announce the restriction and alternative Talk Group over Main 1. Hospitals in the affected talk group area will be notified by dispatch landline, so those medic units at the hospitals will be notified of the talk group restriction.

5.3.3 Progress report

1. A Progress Report (PR) is essential to any ongoing incident in that it keeps all concerned parties abreast of a dynamic situation. It is designed to provide information which:
 - a. Allows Dispatch latitude in filling vacant stations.
 - b. Updates Chief Officers.
 - c. Updates the Information Officer.
 - d. Permits continuous documentation of an ongoing incident.
2. The first PR shall be transmitted at approximately ten(10) minutes after the BIR. The Dispatcher will “prompt” the Incident Commander if no PR is received after fifteen (15) minutes. Thereafter, PR’s shall be transmitted at intervals deemed appropriate by the Incident Commander. A PR shall be transmitted after each transfer of Command. However, in no case should an interval exceed thirty (30) minutes. The PR shall consist of the following information:
 - a. Description of the current situation.
 - b. Description of current tactical objectives.
 - c. Status of resource needs.
 - d. Length of time holding units from 1st unit to the last unit.

Example:

“Dispatch from Division/Battalion 1, Chief Smith assuming command. At present all units are being held. Companies are making progress on a “Working Fire” in a 2 ½ story wood frame dwelling. We are conducting a primary search and making an aggressive interior attack with hand lines. Units will be out for over an hour.”

When units are responding to a medical emergency in a structure under normal conditions, no PR is necessary. However, should the incident escalate to bigger proportions, PR’s would become appropriate.

Command must conduct Progress Report and a PAR before changing strategies, from offensive to defensive operations, to ensure all personnel are a safe distance from fire building.

SECTION 6: STAGING

1. Staging Areas are locations designated within the incident area, which are used to temporarily locate resources that are available for assignment. If OPS Section is established, staging reports to the Operations Section Chief. Staging will request logistical support (for example, food, fuel, sanitation) from the Logistics Section.
2. The purpose of staging is to provide a standard system of resource placement prior to tactical assignments. Failure to utilize staging adds to the confusion on the incident scene. Lack of staging also results in units determining their own tactical assignments (freelancing). ICs will lose track of their resources, priorities can be overlooked, inability to oversee personnel safety, and a general lack of accountability.

6.1 Level I Staging

1. Level I staging is to be utilized by responding units that have not been given an assignment. First alarm units shall deploy in accordance with TAC 8 unless orders to the contrary are received
 - a. Level I staging shall automatically be followed unless specific orders to the contrary are received. Units should take up positions to support earlier arriving companies. Units shall proceed to an appropriate location approximately one (1) block from the scene. Upon arrival at this location unit commanders shall transmit (Unit ID) is staged and their location. This message will inform the incident commander that the unit is ready for assignment.
 - b. Staged units shall not commit to any operation without having received orders or approval from COMMAND.
 - c. Staged units shall not request assignments from Command. If a staged unit feels that the BIR or PR indicates a need for their unit and no orders have been received, they shall repeat the transmission. “Unit (ID) is staged at (location).” If the 2nd transmission is not acknowledged, the unit leader shall report directly to the Incident Commander.

6.2 Level II Staging

1. Level II staging is to be utilized by all responding units beyond the 1st Alarm assignment.
2. Level II staging shall utilize an area suitable to park, organize, and coordinate the anticipated response of additional resources.
 - a. Command, upon requesting additional resources, may inform Dispatch of the designated location of the Level II staging area.
 - b. The 1st unit leader arriving at the Level II staging area, and without orders to the contrary, shall assume "Staging Area Manager."
 - i. The first engine on the 2nd alarm shall assume Staging.
 - ii. If a staging area has not designated, the Staging Area Manager shall locate an area and inform Command.
 - iii. Truck and Squad Officers should not be used as the Staging Area Manager.
3. Communications to and from the incident scene and the Level II staging area shall be directly between Command (or if established, Operations) and the Staging Area Manager.
 - a. Requests for assignment of units from staging shall be directed from Command or Operations to the Staging Area Manager.
 - b. This communication should be over a separate talk group.
 - c. When making request for personnel and equipment, be specific. For example, I need one crew to the Division 2 with pike poles. They are to report to Captain Smith.
 - d. Units in Level II Staging shall not take any action except as directed by the Staging Area Manager.
4. Duties of the Staging Area Manager.
 - a. Identify location by use of warning lights.
 - b. Log in all responding resources and notify Command or Operations of available resources.
 1. Form 364 is the Fire Ground Staging Chart
 - c. Position apparatus in such as manner as to avoid congestion and facilitate movement.
 - d. Dispatch resources as directed by Command/Operations.
 - e. Command should state the minimum number of each type of equipment to be held in staging.
 - f. Maintain the level of resources in staging deemed necessary by Command.
 - g. Coordinate with police to insure access and security of the staging area.

APPENDIX A: GLOSSARY OF IMS TERMS

Agency Representative. Individual assigned to an incident from an assisting or cooperating agency that has been delegated full authority to make decisions on all matters affecting that agencies participation at the incident. Agency Representatives report to the Incident Liaison Officer.

Allocated Resources. Resources dispatched to an incident that have not been assigned.

Assigned Resources. Resources checked-in and assigned work tasks on an incident.

Assisting Agency. An agency, other than the one primarily responsible for the incident, contributing suppression, rescue, support or service resources to another agency. (Mutual Aid)

Available Resources. Resources assigned to an incident and available for an assignment.

Base. That location at which the primary logistical functions are coordinated and administered. (Incident name or other designator will be added to the term "Base") There is only one base per incident.

Branch. An organizational level having functional/geographic responsibility for major segments of incident operations. The Branch Level is organizationally between IC (OPS, if established) and Divisions/Groups.

Chief. IMS title for individuals responsible for command of the functional Sections: Operations, Planning, Logistics and Finance/Administrative.

Clear Text. The use of plain English in radio communications transmissions. No agency specific codes are used when using Clear Text.

Command Post (CP). The location from which primary command functions are executed.

Command Staff. The Command Staff consists of the Information Officer, Safety Officer, and Liaison Officer, who report directly to the Incident Commander.

Command. The act of directing, ordering, and or controlling resources by virtue of explicit legal, agency, or delegated authority.

Company Officer. The individual responsible for command of a Company. This designation is not specific to any particular fire department rank.

Company. A ground vehicle providing specified equipment capability and personnel (Engine Company, Truck Company, Rescue Company, etc.)

Cooperating Agency. An agency supplying assistance other than direct suppression, rescue, support or service functions to the incident control effort (Red Cross, law enforcement agency, telephone company, Highways, etc.)

Crew. A specific number of personnel assembled for an assignment such as search, ventilation, or hose line deployment and operations. The number of personnel in a crew should not exceed the recommended span-of-control guidelines of three (3) to seven (7). A crew operates under the supervision of a Crew Leader.

Director. IMS title for individuals responsible for command of a Branch.

Dispatch Center. A facility from which resources are directly assigned to an incident.

Division. That organization level having responsibility for operations within a defined geographic area. The Division level is organizational between Single Resources, Task Force, or the Strike Team and the Branch.

General Staff. **The group of incident management personnel comprised of the Operations Section Chief, Planning Section Chief, Logistics Section Chief, and Finance/Administrative Section Chief.**

Group. **The organizational level responsible for a specified functional assignment at an incident (ventilation, salvage, water supply, etc.).**

Incident Action Plan. **The strategic goals, tactical objectives, and support requirements for the incident. All incidents require an action plan. For simple incidents the action plan is not usually in written form. Large or complex incidents will require that the action plan be documented in writing.**

Incident Command System (ICS). **A system with a common organizational structure with responsibility for the management of assigned resources to effectively accomplish stated objectives and goals at an incident.**

Incident Commander (IC). **The individual responsible for the management of all incident operations.**

Information Officer. **The person responsible for providing information to the media or other appropriate agencies requiring information directly from the incident scene. Member of the Command Staff.**

Initial Attack. **Resources initially committed to an incident.**

Intelligence Officer. The intelligence officer is responsible for managing internal information, intelligence, and operational security requirements supporting incident management activities. These may include information security and operational security activities, as well as the complex task of ensuring that sensitive information of all types (e.g., classified information, law enforcement sensitive information, proprietary information, or export-controlled information) is handled in a way that not only safeguards the information, but also ensures that it gets to those who need access to it to perform their missions effectively and safely.

Leader. **The individual responsible for command of a Crew, Task Force, Strike Team, or Functional Unit.**

Liaison Officer. **The person serving as the point of contact for assisting or coordinating agencies. Member of the Command Staff.**

Logistics Section. **Responsible for providing facilities, service, and materials for the incident. Includes the Communications Unit, Medical Unit, and Food Units, within the Service Branch and the Supply Unit, Facilities Unit, and Ground Support Units, within the Support Branch.**

Officer. **The Command Staff positions of Safety, Liaison, Intelligence, and Information. Other positions within the IMS organization commonly using the term Officer include Water Supply (Water Officer).**

Operational Period. **The period of time scheduled for execution of a given set of operation actions as specified in the Incident Action Plan.**

Operations Section. **Responsible for all tactical operations at the incident. Includes up to five (5) Branches, twenty five (25) Divisions/Groups and one hundred twenty five (125) Single Resources, Task Forces, or Strike Teams.**

Out-of-Service Resources. **Resources assigned to an incident but unable to respond for mechanical, rest, or personnel reasons.**

Planning Meeting. **A meeting, held as needed throughout the duration of an incident, to select specific strategies and tactics for incident control operations and for service and support planning.**

Planning Section. **Responsible for collection, evaluation, dissemination, and use of information about the development of the incident and the status of resources. Includes the Situation Status, Resource Status, Documentation, and Demobilization Units as well as Technical Specialists.**

Reporting Locations. Any one of the six facilities/locations where incident-assigned resources may check in. The locations are: Incident Command Post - Resources Unit (RESTAT), Base, Camp, Staging Area, Helibase, or Division Supervisor for direct line assignments. (Check in at one location only).

Resource Status Unit (RESTAT). Functional Unit within the Planning Section. Responsible for recording the status of resources committed to an incident. Additionally, the evaluation of resources currently committed, the impact that additional responding resources will have on the incident, and anticipated resource needs.

Resources. All personnel and major items of equipment available, or potentially available, for assignment to incident tasks on which status is maintained.

Safety Officer. Responsible for monitoring and assessing safety hazards, unsafe situations, and developing measures for ensuring personnel safety. Member of the Command Staff.

Section. That organization level having functional responsibility for primary segments of incident operations, such as: Operations, Planning, Logistics, Finance/Administrative. This Section level is organizationally between Branch and Incident Commander.

Single Resource. An individual Company or Crew.

Situation Status Unit (SITSTAT). Functional Unit within the Planning Section. Responsible for analysis of situation as it progresses. Reports to Planning Section Chief.

Staging Area. That physical location where incident personnel and equipment are assigned on an immediately available status. The Staging Area is supervised by the Staging Area Manager.

Strategic Goals. The overall plan that will be used to control the incident. Strategic goals are broad in nature and are achieved by the completion of tactical objectives.

Strike Team. Up to five (5) of the same kind and type of resources, with common communications and a leader.

Supervisor. Individuals responsible for command of a Division or Group.

Tactical Objectives. The specific operations that must be accomplished to achieve strategic goals; Tactical objectives must be both specific and measurable. Tactical level officers are Division or Group.

Task Force. A group of any type and kind of resources, with common communications and a leader, temporarily assembled for a specific mission generally, it should not exceed five resources.

Technical Specialists. Personnel with specific skills who are activated only when needed. Technical Specialists may be needed in the areas of fire behavior, water resources, environmental concerns, resource use, and training. Technical Specialists report initially to the Planning Section but may be assigned anywhere within the ICS organizational structure as needed.

Unit. That organization element having functional responsibility for a specific incident's Planning, Logistics, or Finance/Administrative activity.

Tanker. Any ground vehicle capable of transporting specified quantities of water. In Baltimore County a "Tanker" has a capacity of one thousand (1000) gallons or greater.

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APPENDIX B: GLOSSARY OF RADIO TERMS

Overview: All radio transmissions are to be clear text.

1. Standard message format: Unit being called FROM Unit calling then the message.
 - a. For example, "Engine 451 from Engine 442 charge the supply line"
2. Radio identifications.
 - a. Unit Name and Number represents the Officer In Charge of the unit.
 - i. "Truck 1" is the designation of the Officer in Charge of Truck 1.
 - ii. "Medic 1" is the person in charge of Medic 1
 - iii. "Boat 219" is the person in charge of Boat 219
 - b. Unit Name and Number Mobile represents the driver/operator of the unit.
 - i. "Engine 1 Mobile" is the driver/operator of Engine 1.
 - c. Other portable radio designations should be by riding position.
3. Definitions and Descriptions.

Abandon your position. **When we are in the defensive mode and the abandon your position order is given/sounded, you are to abandon your engine/truck/squad and move away from the incident to a safe area. A PAR will be conducted, and your safe area will be reported to Command.**

Acknowledge. **A request for the receiver of a message to declare that the message has been received and understood. The receiver should repeat back the message to the sending unit.**

Advise. **Give to the person identified the following message.**

ALS Strike Team. **Four (4) Advanced Life Support staffed transport units, an EMS Lieutenant and one (1) Engine Company. If a Division/Battalion Chief is not on the incident scene at the time of the request a Division/Battalion Chief shall be dispatched.**

Arrived. **Confirms that a unit has reached its destination. EMS units may follow the transmission with the *Regional Hospital Identification Number* when they reach a Hospital. For example, "Engine 17 arrived" and "Medic 12 arrived at 204."**

Available. **Indicates that a unit is capable of responding to an incident within its assigned district, and is monitoring the correct Talk group; the reason is not to be stated. For example, "Engine 101 is available" and "Medic 203 is available."**

Be advised. **A correction to the message you have just transmitted will follow.**

Brief Initial Report (BIR). **A radio report given by the first arriving Officer or Acting Officer to describe the scene and situation.**

Clear. **Unit has completed its assignment is leaving the scene, and is "Available." For example, "Medic 13 is clear" and "Truck 323 is clear."**

Command. **The radio identification of the Incident Commander. Each incident has only 1 Incident Commander. The Location of the Incident commander, such as a street name should follow shortly after command is established. When transmissions are made to dispatch the Location identification should precede the "command" terminology.**

Correction. **The message transmitted contains an error. The correct information will follow.**

Dispatch. **The Baltimore County Dispatch Center.**

Engine Strike Team. **Five (5) Engine Companies and a Division/Battalion Chief.**

Enroute. **Confirms that a unit is responding to a location. EMS units when transporting to a hospital must follow the transmission with the Regional Hospital Identification Number. For example, “Engine 16 enroute” and “Medic 11 enroute to 217.”**

Evacuate the building. **When we are in the offensive mode and the evacuation order is given/sounded, you are to abandon your hose lines and exit the building. A PAR will be conducted.**

Fire Showing. **Describes visible fire from a building. Generally, this would be followed by the location from which the fire is originating.**

In service at Location. **Indicates that unit is “Available” but is remaining on the scene of the incident to which they were dispatched.**

In station. **Apparatus has returned to a station and is ready to respond.**

Knockdown. **A condition where the main body of fire has been contained or knocked down but not necessarily extinguished.**

Limited Command. **Is used when the first arriving officer is confronted with a tactical situation that requires immediate attention.**

Medical Strike Team. **Four (4) EMS transport units with ANY manning configuration, an EMS Lieutenant, one (1) Engine company and a Division/Battalion Chief. The Division/Battalion Chief is dispatched only if one is not already on the scene.**

Medical Task Force. **Four (4) EMS transport units with ANY staffing configuration, an EMS lieutenant, one (1) Engine company, one (1) Rescue Squad, and a Division/Battalion Chief. The Division/Battalion Chief should only be dispatched if one is not already on the scene.**

Motor Vehicle Incident. **Identifies an incident that involves motor vehicles. The incident may be further described as: with personal injury, property damage only, pedestrian struck, or motorcycle.**

Nothing Evident. **Describes a condition where there are NO INDICATIONS OF A FIRE. Used in conjunction with the B.I.R.**

OK. **Indicates that a message has been received and will be completed.**

Out of Service. **Term used to indicate a unit cannot respond to an incident. An explanation should be provided with the message. For example, “Medic 11 out of service at the station for cleanup” and “Truck 5 out of service for repairs.”**

PAR. **Personnel Accountability Report, a physical check of personnel working on an incident performed by their supervisor and reported to the incident Commander via the organizational framework in place at the time it is taken. For example, “Command from Division 2, Division 2 is PAR for E1 Crew, E2 and T1. A PAR is required when changing modes from offensive to defensive.**

Primary Search. **The immediate search for victims undertaken by the first arriving units at an incident.**

Progress Report (PR). **A report given to define actions ongoing, progress being made, a change in the Incident Commander and should include a general “picture” of the scene. A Progress Report should be given whenever a transfer of command takes place or at approximately ten (10) minutes after any B.I.R. Dispatchers should**

“prompt” the Incident Commander for a Progress Report if one is not provided within fifteen (15) minutes after the B.I.R.

RIT. Rapid Intervention Team is used to rapidly assist Fire Service Personnel who may become lost, trapped, or in need of immediate medical assistance while operating at emergency incidents. Tactical 18 covers RIT operations.

Relocating. Transferring to another Station

Repeat. Repeat your last message

Secondary Search. A more complete search, preferably conducted by personnel who did not perform the “Primary Search,” for victims.

Smoke Showing. A term used to describe visible smoke. Used in conjunction with the “B.I.R.”

Standby. Listen, and do not transmit unless “Urgent.”

Tanker Strike Team. One (1) Large Capacity Tanker (greater than 2000 gallons), three (3) Tankers, and one (1) Tanker Support Unit. This Strike Team will be under the supervision of the Water Supply Officer.

Test Count. Counting from 1 - 5 (short test count) or 1 - 10 (long test count) used to determine radio quality.

That is correct. What you have said is correct.

Under Control. The Fire has been suppressed to a stage where no additional property damage is anticipated.

Urgent. A term used to preface a message of critical importance.

Verify. Check the entire message and correct if necessary.

Working Fire. A term used in conjunction to identify a fire in a structure that is of sufficient intensity so as to require the commitment of ALL UNITS assigned on the initial dispatch. This report will cause the dispatching of an Air Unit, a Medic Unit, and an Engine Company to serve as the Rapid Intervention Team.

APPENDIX C: PROCEDURE FOR TWO IN TWO OUT COMPLIANCE

The following procedure has been established to provide direction for operations in IMMEDIATELY DANGEROUS to LIFE HEALTH (IDLH) or potential IDLH atmospheres and to adhere to accepted standards of firefighter safety. In accordance with NFPA 1500, OSHA 29 CFR 1910.120 & 1910.134, the Baltimore County Fire Department will maintain a safe practice of “2 in and 2 out” when operating in and around hazardous environments. This policy will affect all Career and Volunteer members, as well as any other agency involved in any fire department operations.

1. DEFINITIONS:

IDLH: an atmospheric concentration of any toxic, corrosive, or asphyxiant substance that: 1) poses an immediate threat to life or, 2) would cause irreversible or delayed adverse health effects or, 3) would interfere with an individual’s ability to escape from the dangerous atmosphere. Atmospheres with a concentration of oxygen by volume of less than 19.5% will be considered as IDLH. Where reasonable suspicion exists, an atmosphere will be considered IDLH until proven otherwise (i.e., CO detector sounding, etc.).

NOTE: An interior structural fire that is outlined in the Baltimore County Fire Service Incident Management system either SMOKE SHOWING or FIRE SHOWING as well as a WORKING FIRE will always be classified as an IDLH situation. The only exception shall be an incipient stage fire as outlined by OSHA’s following classification: 29 CFR 1910.155 (26), as a “fire which is in the initial or beginning stage and which can be controlled or extinguished by portable fire extinguishers, class II standpipe or small hose systems without the need for protective clothing or breathing apparatus.”

“2 in 2 out” Term used to describe a required two person entry team “in” the hazardous area and the required two person standby team equally trained and qualified positioned just “outside” the hazardous area based on a risk based response.

The following are examples of a risk-based response in the Baltimore County Fire Service:

1. **Incipient stage fire:** no SCBA needed or nothing evident upon arrival. A small fire that can be handled with a portable extinguisher or small line. A crew can deploy and extinguish fire without having standby crew outside. This is allowed under the standard of 2 in 2 out.
2. **Smoke or fire showing:** where one or more companies are needed to control the incident but not committing the entire first alarm. 2 in 2 out is required. The backup team can be ready to go in a very short order.
3. **Working fire:** All first alarm companies will be required to extinguish the fire, such as large complex operations: apartments with multiple rooms involved or mercantile establishment. Back up and/or R.I.T. teams will be needed and ready to deploy directly outside the hazard area. In this operation, the 2 out must be in full PPE with SCBA donned in close proximity to the point of entry before the attack team can enter.

NOTE: These are just a few examples of risk-based responses. The first in Officers will have to make the decision – **always keeping crew safety the first priority.**

2. Operations in an IDLH Area

Personnel will be in full personal protective equipment, with self-contained breathing apparatus donned and operating before entering an IDLH or potential IDLH area as outlined in standard operating procedure 400-26. Personnel required to enter an IDLH area or potential IDLH area, will at all times utilize the “buddy” system of teams of two or more. Personnel will not enter alone. Team members must remain in direct visual or voice contact with one another at all times. At no time will team members be separated from one another. Each team member will be responsible to provide fellow team members with assistance if needed, to warn of hazards encountered, and to routinely check on the welfare of fellow team members.

3. ‘TWO IN - TWO OUT’ DURING INITIAL STAGES OF MITIGATION

1. Prior to personnel entering the IDLH area, a standby team must be assembled that is equally trained and qualified outside the hazardous area. As outlined by the Baltimore County Fire Service Personnel Accountability System (TAC 06).
2. The mission of the standby team is to provide assistance to the interior personnel in the event of a mayday.
3. The standby team will consist of two or more personnel with full PPE with SCBA ready for immediate service according to the Baltimore County Fire Service risk based response. The officer will be in full PPE and SCBA. The FADO will have turnout pants, PBI hood, turnout coat, and SCBA readily available. The FADO must wear a helmet once exiting the cab.
4. The standby team will have a separate hose line in place (if required), along with any basic equipment needed to initiate a possible rescue of fire service personnel as directed by the Incident Commander.
5. The standby team will stay focused on the activities of the interior team and will maintain visual, voice, or radio contact with them, as available.
6. Standby team members may be assigned other duties provided that such duties do not interfere with their ability to perform the specific function of standby team or cause them to abandon their position. Examples may include but are not limited to: flaking out hose lines, ground level exterior ventilation, equipment retrieval if apparatus is within 50' of standby team position, lighting, utilizing hose streams for exposure protection or exterior attack if appropriate.
7. Additional duties will be restricted so as not to require the abandonment of the standby team position outside the hazardous area.
8. In the event, the standby team must perform functions that would interfere with their mission, such as performing CPR, they will inform the interior personnel to exit the IDLH area. The interior personnel will immediately withdraw from the IDLH area until another standby team can be assembled. If Command is not part of the standby crew, Command needs to be notified.
9. It is the intent of this policy to require a total of four personnel to be assembled at the incident scene prior to entry into the IDLH area.

NOTE: The only exception to the above shall be life safety based on the basic principle of search and rescue. If YOU arrive and YOU see or hear a victim trapped in an IDLH situation and the rescue is specific and measurable, you may immediately enter the IDLH area. Those victims that are reported must be verified as to location and last time seen before you can make entry in an IDLH situation.

10. If the first arriving unit does not meet the minimum staffing of four white tags, they will perform EXTERIOR operations while waiting for the assembly of adequate personnel for entry. These may include but are not limited to:

Status reporting	Exposure protection
Establishing Command	EMS for victims
Requesting additional resources	Isolation
Exterior Rescue	Exterior horizontal ventilation
Exterior Fire Attack	Establish water supply

Once the incident progresses and higher numbers of personnel arrive on the scene, and operations expand, a Rapid Intervention Team (RIT) will be established to replace the initial standby team.

4. COMPLIANCE

Any deviation from this guideline should be reported to the I.C. and then referred to the Safety Office. The Safety Office will be responsible for the determination of a violation of the Two in Two out policy. The first Chief Officer assigned to the incident shall be the investigating officer unless otherwise designated by the Safety Office. The investigating Chief Officer shall submit the following information to the committee:

1. The incident number, date, time, location.
2. The Brief Initial Report (BIR) or statement indicating the conditions upon arrival. This will identify the presence of an IDLH atmosphere.
3. A summary of the initial activity at the scene including:
 - a. Arrival times of equipment

- b. Staffing level of the equipment
 - c. What PPE was donned by each person at the scene at the time of IDLH entry?
 - d. What functions were being performed at the scene at the time of IDLH entry?
4. Was a proper standby team established, according to this policy, prior to IDLH entry?
 5. If no to number four why was entry made to the IDLH prior to the standby team establishment?
 6. What were the times of IDLH entry and the establishment of the proper standby team?

Appendix C-4: Tactical 08 Fireground Operations

S.O.P. #: TACTICAL OPERATIONS MANUAL #08

SUBJECT: FIREGROUND OPERATIONS

DIVISION: EMERGENCY OPERATIONS

Objective: To provide a standardized and consistent approach to structural firefighting strategies and tactics

Scope: Application of these guidelines facilitates the following objectives:

- The appropriate placement of apparatus
- The rapid and efficient deployment of crews
- The implementation of the correct mode of attack
- The identification and control of flow paths
- A coordinated ventilation and fire attack

Officers who deviate from these guidelines to address specific incident needs when conditions or situations warrant must immediately notify the incident commander of their actions. The following priorities will guide decision making during the incident:

- Life Safety
- Incident Stabilization
- Property Conservation

When operating at structure fires, the following tactical goals apply:

Structural Fire Tactical Goals
S.L.I.C.E.R.S

Sequential Actions: To take place in order

Size Up

Locate the Fire

Identify and Control Flow Path

Cool the Space from the Safest Location

Extinguish the Fire

Actions of Opportunity: May occur at any time

Rescue

Salvage

The incident commander should consider the potential for rescues at all times. Firefighters should always be prepared to remove trapped or endangered occupants. Often the best action the fire department can take is to immediately suppress the fire. The IC and fireground officers must make a rapid and informed choice on the priority and sequence of suppression activities vs. occupant removal. As life safety is the highest tactical priority, rescue shall always take precedence. The IC must determine the best course of action to ensure the best outcome for occupants based on the conditions at the time.

The incident commander must consider all critical factors including, but not limited to, building construction, age of structure, crew resources, sustainability of a water source, location of fire, probability of viable victims, and the extent of the fire when determining the appropriate type of fire attack.

Interior: Interior fire attack with coordinated ventilation operations

Transitional: Exterior knockdown transitioning to an interior attack with coordinated ventilation

Exterior: Exterior fire attack operations

Section 1: Engine Company Riding Positions and Descriptions

A. Riding Positions:

1. Officer: Portable #1-retains the identity of the unit assigned; i.e. Engine-1.
2. Back-up: Portable #2-retains the identity of the unit and the position; i.e., Engine-1 Back up.
3. Nozzle: Portable #3-retains the identity of the unit and the position; i.e., Engine-1 Nozzle.
4. Driver: Portable #4-retains the identity of the unit and the position; i.e., Engine-1 Driver.
5. Extra Firefighter: This identity will be reserved for those occasions that an extra firefighter rides the apparatus, regardless from where their portable is appropriated; i.e., Engine 1-Portable 5.

B. Riding Descriptions

1. Officer (Shall don full turnout gear including SCBA regardless of whether or not they are entering an IDLH).
 - a. The officer will ensure that all members of their crew are in full PPE including SCBA prior to entry into an IDLH.
 - b. The officer shall direct the driver to position the engine:
 1. To facilitate the most efficient hose line placement.
 2. To ensure the apparatus will not block the truck company from having the closest access to the structure for optimal use of the aerial and ground ladders.
 3. Should consider the possibility of having to quickly change attack mode from an interior to exterior operation.
 - c. Upon arrival, the Officer shall perform the following tasks:
 1. Transmit a Brief Initial Report (BIR)
 2. Transmit a Water Supply Plan to all units responding.
 3. Establish appropriate level of command.
 4. Conduct an initial size-up and risk assessment.
 5. Perform a 360 degree size-up of the involved structure unless the size of the structure, or immediate fire ground concerns, make a 360 impossible.
 6. Announce the mode of attack being employed (interior, transitional, exterior)
 7. Address "2In/2Out" in accordance with Tactical 07.
 8. Will make every attempt to rule out the presence of a basement fire before committing crews to a first floor fire attack. If a basement fire is present, it will be announced by Command, and repeated by Dispatch to all units.
 - d. If the officer opts to go into Command Mode, he/she shall:
 1. Along with the driver operate as the 2-OUT in accordance with Tactical 07.
 2. Designate an Incident Safety Officer in accordance with (Personnel 21.2-C) or;
 3. Shall retain Incident Safety Officer in the early stages of an incident until adequate resources have been assembled on the fire ground.
 - e. The officer shall order the stretch of the appropriate hand line or master stream.
 1. This decision should be based on the fire flow needs of the incident.
 2. The minimum acceptable fire flow for any (1) 1 ¾" hand line at structure fires will be 150GPM.
 3. The minimum acceptable fire flow for any (1) 2 ½" hand line at structure fires will be 250GPM.
 - f. The officer shall order the placement of the attack line based on the following:
 1. The attack line's objective:
 - To protect potential victims and fire crews.
 - To confine the fire.
 - To control the fire.
 2. The mode of attack, interior, transitional or exterior.
 3. The fires location i.e., basement, top floor, 1st floor, multiple floors, etc.
 4. The safest and quickest position to put water on the fire immediately.

5. The officer will make every effort to determine the location of the fire before the attack line enters the IDLH.
- g. The officer will make every effort to determine the location of the fire prior to ventilation. Once it is determined that ventilation is appropriate, the officer will announce where, how and who will perform the ventilation.
2. Back-up Firefighter (Shall don full turnout gear including SCBA)
 - a. The Back-up and Nozzle firefighters will team up to stretch and stage the attack line.
 - b. After the Nozzle firefighter starts the stretch the Back-up firefighter will make sure the line pays out of the hose bed smoothly.
 - c. When the Nozzle firefighter reaches the entrance, the Back-up firefighter will chase out the kinks from the engine to the nozzle, making sure the hose is properly staged. This will ensure proper flow and safe line advancement.
 - d. The Back-up firefighter will team up with the OIC when it is necessary for the Engine Company to perform forcible entry.
 - e. The Back-up firefighter will bring the appropriate forcible entry tools.
 - f. The Back-up firefighter will be responsible for the following tasks at the scene of a fire.
 1. Make sure the line is unobstructed and free of kinks as it goes through the door. Control the access door opening to limit the influx of additional oxygen into the space (flow path control)
 2. When you come to a corner stop, make sure the line moves freely around any pinch points
 3. Don't get too far separated from the Nozzle firefighter, you are a team.
 4. Move up on the line and back up the Nozzle firefighter so he can focus on stream application.
 5. Monitor conditions behind you and the Nozzle firefighter.
 6. Once the fire has been knocked, the Back-up firefighter may search for victims in the immediate area of the hose and nozzle, while maintaining orientation to the hoseline.
3. Nozzle Firefighter (Shall don full turnout gear including SCBA)
 - a. The Nozzle firefighter will stretch the line ordered by the officer and will be responsible for the following tasks at the scene of a fire.
 1. Make sure the hoseline is charged prior to entry into an IDLH atmosphere.
 2. Once charged, bleed off the hoseline until all the air is expelled prior to entry.
 3. Make sure you are using the right stream, pattern and GPM for the fire conditions.
 4. Know when to open the nozzle, when to start flowing water, and how to apply the stream.
 5. Never pass a burning room or area; extinguish the fire as you find it.
 6. Keep the IC and your officer updated on your progress.
 - b. The Nozzle firefighter shall not leave the nozzle:
 1. Unless an emergency evacuation is ordered. If an emergency evacuation is ordered the Nozzle firefighter will make every attempt to ensure crews operating above, and in front of them have exited.
 2. Until he/she has been relieved by another firefighter.
 3. Unless the hoseline has been withdrawn from the structure.
 4. Until an IDLH atmosphere no longer exists (per Command).
4. Driver (Shall don at a minimum Helmet and Gloves, with Turnout Gear and SCBA, readily available)
 - a. The Driver will position the engine as directed by the officer and will be responsible for the following tasks at the scene of a fire:
 1. Upon arrival, the driver shall assist in the stretch of the initial attack line, assuring that the hoseline clears the hose bed and any obstructions around the engine.
 2. The driver shall charge the attack line at the direction of the Nozzle firefighter or the OIC.
 3. He/she will advise the 2nd arriving engine by radio when ready for water.

4. He/she may advise the 1st arriving truck company by radio which direction to enter the block to allow the best access to the front of the structure.
5. If time permits, the Driver will stretch a second attack line to the point of entry.
6. If time permits, the Driver will throw a ground ladder prior to the arrival of the 1st truck.

b. The Driver will pump the attack line at the appropriate pressure to achieve the desired GPM flow, factoring in friction loss and nozzle pressure.

C. Hose Line Placement and Extension

1. All 1 ¾" adjustable fog nozzles on Baltimore County fire engines shall be set to 150 GPM minimum.

2. Selection and Placement

- a. The initial attack line should be used to control access and, to support search and rescue activities by confining fire spread from halls, stairwells, and other means of egress.
- b. Do not advance a dry line into a fire area/IDLH. An attack line should be stretched to a safe area and then charged.
- c. Advancing more than two lines through a single point of entry may make attack line advancement and personnel movement more difficult; separate points of entry should always be considered. If multiple points of entry are used then firefighters should be assigned to control the access openings (flow path control).
- d. Officers should consider a transitional fire attack (knocking down the fire by directing a stream into the fire from the exterior) if this is the quickest method to put water on the fire immediately.
- e. Consider initiating an attack with a 2 ½" Blitz Line in any mercantile/apartment/large fire load structure. Keep in mind that 2 ½" smooth bore nozzle with a 1 ¼" tip can provide over 300 GPM at only 50 PSI.
- f. Consider initiating an attack with a 2 ½' Blitz Line on any well-involved residential structure, bearing in mind however that advancement of the Blitz Line within a residential structure will be very difficult. If the Blitz Line knocks down the bulk of the fire, consider switching to 1 ¾" lines at that point.
- g. If the initial attack line is not making progress, consider deploying a 2 ½" Blitz Line as the back up line.
- h. Once exterior master stream operations have been initiated, use of 1 ¾" lines can usually be discontinued or used only for exposure protection.
- i. Incident commanders should recognize that the deployment of a Blitz Line may require two crews.

Section 2: Engine Company Operations

The engine's primary job is to safely and efficiently place the appropriate attack line in service to extinguish the fire. The most valuable life saving tactic performed at a fire is to put water on the fire as quickly as possible.

A. 1st Arriving Engine

1. The 1st arriving engine, when dispatched as a Fire Box, should initiate a constant water supply. They should locate the closest water source in their response path and lead off. After wrapping the hydrant with the Humat and dry LDH, the engine shall proceed to a position on side Alpha of the structure. The 1st arriving engine may bypass the closest water source if it is within 100' of the structure and can be easily 'hand-jacked' by the Driver.
2. No personnel shall ride the tailboard while laying lines.
3. If the closest water source to the structure is not in the engine's response path, the crew shall choose one of the following to initiate the water supply:

- a. Drop a split lay at an appropriate location.
 - b. If the closest water source is beyond the structure, the OIC shall instruct the 2nd arriving engine to reverse lay from the 1st arriving engine to the source.
4. If the 1st arriving engine positions “on” a water source, the officer shall advise the 2nd engine (i.e. “Engine 54 arrived with my own water source.”).
5. The crew of the 1st arriving engine will place the primary attack line in-service to achieve the appropriate fireground objective:
- a. Interior fire attack.
 - b. Transitional fire attack
 - c. Exterior fire attack
 - d. Support search and rescue or victim removal.
 - e. Protect stairwells, hallways and other means of egress.
 - f. Exposure Protection
6. The first arriving officer will announce if and where ventilation is to occur, and who will be performing the ventilation.

B. 2nd Arriving Engine:

- 1. Should complete the water supply for the 1st arriving engine upon direction from the IC:
 - a. In hydrant areas, the 2nd arriving engine can pump the 1st engine’s hydrant.
 - b. 2nd arriving engine can complete the split lay to the water source and pump it.
 - c. 2nd arriving engine can reverse lay from the 1st engine to the water source and pump it.
 - d. The 2nd engine may be sent to side Charlie at the discretion of Command.
- 2. If the 1st arriving engine is “on” the hydrant, the 2nd arriving engine shall:
 - a. Establish its’ own water supply from a separate source.
 - b. Position on side Alpha.
 - c. Leaving adequate space for the truck.
- 3. If directed by Command to position on side Charlie, the 2nd arriving engine shall:
 - a. Establish its’ own water supply from a separate source.
 - b. Position on side Charlie.
 - c. Conduct a size-up of conditions on side Charlie and report to Command.
 - d. The officer will not assume responsibility for Division Charlie unless the IC assigns you as such.
- 4. The OIC of the 2nd engine will be assigned as the division officer on the fire floor and will assume responsibility for crews operating in this area unless:
 - a. The IC has directed the 2nd arriving engine to operate in some other area.
 - 1. The officer of the 1st arriving engine can be division officer on the fire floor.

2. In any instance that the 1st arriving Officer declares "limited command", the 2nd arriving officer must assume Command upon arrival.

5. The crew of the 2nd arriving engine shall advance a back-up line equal in size and flow capabilities to the primary attack line to achieve the following objectives:
 - a. Protect the initial crew.
 - b. Cut off fire advancement on the floor above the fire.
 - c. Assist in extinguishment.
6. If the initial attack line is not making progress, consider deploying a 2 ½" Blitz Line as the back up line.
 - a. The back-up line may be advanced from either the 1st or 2nd arriving engine, depending on apparatus location.
 - b. The back-up line will usually proceed through the same point of entry as the initial line.

C. 3rd Arriving Engine:

1. The 3rd arriving engine is the most versatile 1st alarm unit. The officer and crew should be capable of undertaking any fireground operation including but not limited to:
 - a. Engine Company Support
 1. Advancing back-up lines on the fire floor or floor above.
 2. Advancing attack lines into exposures, attics, cocklofts or basements.
 - b. Secondary Water Source
 1. In hydrant areas, prepare to lay LDH, leaving a firefighter at the hydrant.
 2. If the BIR or subsequent progress report indicates a fire, the 3rd arriving engine will establish its own water supply.
 - c. Truck Company Support
 1. Search, ventilation, laddering.
 2. Setting up for defensive operations.
 - d. Emergency Medical Support
 1. Treating injured personnel and civilians.
 2. Victim removal and/or triage.
2. If the 2nd arriving engine doesn't position on side Charlie and side Charlie is accessible by apparatus the 3rd arriving engine shall:
 - a. Establish its' own water supply from a separate source.
 - b. Position on side Charlie.
3. If the 2nd arriving engine has positioned on side Charlie or if side Charlie is inaccessible by apparatus the 3rd arriving engine shall:
 - a. Lead-off from a hydrant to a location that provides the best tactical access to side Charlie, this may be side Alpha.
 - b. If uncertain, contact Command for instructions.
 - c. Position so the responding trucks will have the closest possible access to facilitate ground ladder use and aerial operations.
 - d. Regardless of where the 3rd engine positions the officer shall:
 1. Assess fire conditions and advise Command as necessary.

2. Pay particular attention to the basement, fire floor and floors above the fire.
3. Not assume responsibility for a Division unless the IC assigns you as such.
4. The officer and crew shall stretch an attack line of sufficient length to reach any interior portion of the structure. This line will be flaked-out, but remain uncharged until the line has been advanced to an appropriate point of entry and the officer receives further instructions from Command.
5. Attack line coordination can only be done at the direction of the IC after assuring that other crews are not in opposing positions and are able to retreat if conditions become untenable.

D. 4th Arriving Engine

1. The driver shall position the apparatus away from the incident scenes directed by the OIC or Command in a manner that will not block other units.
2. The Fourth Engine to arrive on scene will be designated the Rapid Intervention Team (RIT). While the RIT will not be used for any other specific group or division assignments, company officers should consider this resource as “Active RIT”, one that can assist in throwing ground ladders, advancement of hoselines, etc., while maintaining operational readiness to deploy if necessary.
3. The entire crew, including the FADO shall report to the scene in full turnout gear including SCBA, and assume RIT.
4. The officer may be designated as the Incident Safety Officer because the initial duties of RIT closely mimic the duties associated with fireground safety in general. The officer shall continue to work with the RIT crew by:
 - a. Closely monitoring the fireground talk group.
 - b. Assessing fire conditions.
 - c. Identifying hazards.
 - d. Determining points of egress.
 - e. Identifying the locations of operating crews.
5. Upon arrival of the Rapid Intervention Task Force (RITF) units:
 - a. The 4th arriving engine will work under the Rapid Intervention Group officer.
 - b. The 4th Engine’s officer will return to the RITF and another Incident Safety officer will be assigned by the IC. An officer’s training and experience should be considered when assigning an Incident Safety Officer.
 - c. See Tactical 18 for further information.

Section 3: Truck Company Riding Positions and Descriptions

A. Truck Company Riding Positions

1. Officer: Portable #1-retains the identity of the unit assigned. Truck-1
2. Search: Portable #2-retains the identity of the unit and the position. Truck-1 Search
3. Outside Vent: Portable #3-retains the identity of the unit and the position. Truck-1OV
4. Driver: Portable #4-retains the identity of the unit and the position. Truck-1 Driver
5. Extra Firefighter: This identity is for those occasions when an extra firefighter is assigned to ride the apparatus, regardless of where their portable is appropriated. Truck-1 Portable 5

B. Truck Company Riding Descriptions

1. Officer

- a. The Officer will ensure that all members of their crew are in full PPE including SCBA prior to entry into an IDLH. The officer shall be in full turnout gear with SCBA regardless of the fact they are not entering the IDLH.
- b. The Officer shall bring the Thermal Imaging Camera (TIC) and appropriate tools.
- c. The Officer shall direct the Driver to position the truck to ensure the apparatus will have the closest possible access, to the structure for optimal use of the aerial and ground ladders. When making this decision the Officer will be mindful of potential collapse zones.
- d. The Officer and Search firefighter will work together as the Inside Team to perform the primary objectives.
- e. The Officer will determine where to start the search based on the following criteria:
 1. Location of the fire.
 2. Location of reported victims.
 3. Time of day.
 4. Information received from Dispatch and once on scene.
- f. The Officer will ensure that a thorough overhaul operation is performed to ensure:
 1. The fire has not extended.
 2. Hidden pockets of fire are uncovered.
 3. The fire is completely extinguished.
 4. When fire occurs in buildings with large enclosed roof spaces and/or trusses, examination of the ceiling space should occur immediately.
- g. The Officer will advise Command and/or the Division/Group Officer of the Inside Team's intended destination and tactical objective. Command will be advised immediately when the objectives have been met.
- h. The Officer will immediately notify Command and/or the Division/Group Officer of any pertinent information such as:
 1. When victims are discovered.
 2. Identification of hazards.
 3. When fire is extending.
 4. When a hoseline is needed.
 5. If a tactical objective is unable to be met.

2. Search Firefighter

- a. The Search firefighter and Officer still work together as the Inside Team. Upon arrival, the Search firefighter will be responsible for the following tasks:
 1. Carrying the appropriate tools to handle any forcible entry challenge:
 1. The irons-flat head and halligan tools for conventional forcible entry.
 2. Hydra-ram/rabbit tool for inward swinging steel doors.
 3. Bolt cutters for gates, fences and pad locks
 4. K-tool for through the lock entry.
 5. The Search firefighter will normally be assigned the irons, but should be able to quickly size-up the forcible entry challenge so they can bring the appropriate tools
 6. When forcing doors, the firefighter should ensure control of the access doors to prevent the influx of oxygen into the unit.

- b. The Search firefighter will search those areas ordered by the officer but should be familiar with and capable of performing any type of search necessary:
 - 1. Primary search.
 - 2. Secondary search.
 - 3. The crew conducting the primary search should not conduct the secondary search.
 - 4. Aggressive search, starting close to the fire working toward the exit.
 - 5. Active search, searching off the hoseline as the fire is extinguished.
 - 6. Defensive search, performed from the exterior around windows and doorways.
 - 7. Guided search, performed under the direction of a firefighter equipped with a Thermal Imaging Camera.
- c. The Search firefighter, in coordination with command, may perform horizontal ventilation as necessary and appropriate.
- d. The Search firefighter, under the direction of the officer. Will perform overhaul:
 - 1. In walls and ceilings.
 - 2. In attics and cocklofts.
 - 3. Any void spaces.
 - 4. Excessive overhaul to the suspected area of origin should be avoided until the cause of the fire is determined.

3. Driver/Firefighter

- a. The Driver/firefighter and Outside Vent firefighter will work together as the Outside Team. Upon arrival, the Driver/firefighter will usually operate on side Alpha and will be responsible for the following tasks.
- b. The Driver/firefighter will position the truck as directed by the OIC and ensure that:
 - 1. The driver shall chock the vehicle appropriately.
 - 2. During aerial operations, the ground pads shall always be used.
 - 3. Short-jacking permitted only in the most critical situations.
- c. The Driver/firefighter will be responsible:
 - 1. For assuring appropriate ground ladders are positioned usually on side Alpha, for emergency egress of interior crews.
 - 2. For performing horizontal ventilation in coordination with the fire attack and command.
 - 3. For performing vertical ventilation on the roof in coordination with the fire attack and command.
- d. The Driver/firefighter shall proceed to the roof:
 - 1. Primary access to the roof shall be via the aerial ladder when practical as it is the most stable platform to work from.
 - 2. Ground ladders shall be used for secondary access to the roof, and used in conjunction with roof ladders when roof work is to be performed.
 - 3. If you are blocked out and can't use the aerial ladder, contact your officer immediately to notify him/her that there will be a delay getting to the roof.
- e. The Driver/firefighter shall conduct a size-up and give a report:
 - 1. Is the roof safe to operate on or under?
 - 2. Where is the fire? Basement? 1st floor? 2nd floor? All floors?
 - 3. How much fire? Is it through the roof?
 - 4. Read the smoke, volume, velocity, density and color.
 - 5. Is it time to vent the roof?
 - 6. The driver/firefighter may vent the roof after receiving confirmation to do so from command.
- f. Once the roof assignment has been completed, the Driver/firefighter should place additional ground ladders as needed to facilitate access or egress to the fire floor, floor above the fire and the roof.

4. Outside Vent/Tiller

- a. The Outside Vent (OV) firefighter and Driver/firefighter will work together as the Outside Team. Upon arrival, the OV will initially operate on Side Charlie and be responsible for the following tasks:
 1. The OV will conduct a size-up and give a report from side Charlie.
 1. Where is the fire, basement, 1st floor, 2nd floor, all floors or through the roof?
 2. How much? Is it lighting up at the top of a door or blowing out a window?
 3. Read the smoke, volume, velocity, density and color.
 4. Look at the details, how many floors in the rear, additions, awnings, porches, etc.
 2. The OV will perform horizontal ventilation on side Charlie in coordination with the fire attack and command.
 3. The OV will ladder the rear of the structure.
 1. To provide a secondary means of egress.
 2. To facilitate personnel being able to exit the building safely.
 3. To perform coordinated ventilation of the upper floors.
 4. To allow a secondary means to enter the structure.
 4. The OV will perform Vent Enter Isolate Search (VEIS) operations when necessary to assist with the search.
 1. When your officer orders you to do so.
 2. When the Inside Team locates a victim and has not finished searching.
 3. When the Inside Team is delayed gaining entry.
 4. When the OV makes the decision to VEIS you must contact the IC and let them know where you are entering the structure to VEIS and when you are done.
 5. The OV will back up the Driver/firefighter as needed.
 1. Stay in communication with the Roof firefighter and work as a team.
 2. Once you finish your primary go to the roof.

Section 4: Truck Company Operations

A. 1st Arriving Truck

1. The 1st arriving truck will usually position on side Alpha, however, the officer may choose to position the truck elsewhere to improve the capabilities of the apparatus.
2. Inside Team – The Officer and Search firefighter shall proceed immediately to the front of the structure, and as a team perform their primary objectives:
 - a. Gain access for the engine company.
 - b. Perform primary search and rescue starting on the fire floor in those areas most likely to have trapped, viable victims. (as determined by the truck officer)
 - c. When there is no reasonable expectation that life hazards exist, or when other crews have been assigned to handle the search, the officer may opt to perform other critical functions. (i.e., a pre-dawn fire in a strip store, where roof operations are required.
 - d. Provide horizontal ventilation in coordination with the fire attack and command.
 - e. Check for extension and overhaul if necessary.
3. Outside Team – The Driver/firefighter will operate on side Alpha and perform their primary objectives.
 - a. Assure ground ladders are positioned on side Alpha.
 - b. Access the roof.

- c. Conduct a size-up and give a report.
 - d. Perform horizontal and vertical ventilation coordinated with the fire attack and and command.
 - e. If a decision is made to perform vertical ventilation they will proceed with this objective after coordinating with command.
4. Outside Team – The Outside Vent firefighter will operate on side Charlie and perform their primary objectives:
- a. Give a report from side Charlie.
 - b. Perform horizontal ventilation as needed, coordinated with the fire attack and Command.
 - c. Place ground ladders on Side Charlie for a secondary egress.
 - d. Perform VEIS as needed.
 - e. Back-up the Driver/firefighter.
 - f. The Outside Team will advise their officer command when their primary objectives have been completed and when they are moving to a new assignment.

B. 2nd Arriving Truck

1. The 2nd arriving truck will generally support the operations of the 1st arriving truck. The officer shall closely monitor the tactical talk group while responding, in order to track the status of the 1st arriving truck's objectives. The IC may assign tactical objectives to the 2nd arriving truck.
2. If it is accessible, the 2nd arriving truck will position on side Charlie of the structure:
 - a. Unless directed elsewhere by the IC.
 - b. Unless side Charlie is inaccessible.
 - c. If another side appears more tactically advantageous in which case the officer shall contact Command prior to committing the truck to the structure.
3. Inside Team – The Officer and Search firefighter shall proceed immediately to the structure, and as a team, support the 1st arriving truck in performing their primary objectives:
 - a. Perform forcible entry.
 - b. Conduct primary search on the floor above the fire, unless already complete.
 - c. For top floor fires, start at the floor below the fire, working your way down.
 - d. Conduct a secondary search as needed.
 - e. Assist in the removal of victims.
 - f. Check for fire extension in void spaces, walls, ceilings, etc.
 - g. Control the interior utilities.
 - h. The officer will advise Command when they have completed a tactical objective.

4. Outside Team – The Driver/firefighter will proceed to side Alpha and assist the 1st arriving Roof firefighter:
 - a. Ensuring ground ladders are placed as needed.
 - b. Accessing the roof.
 - c. Conducting a size-up and give a report unless it has already been done.
 - d. Performing horizontal and vertical ventilation in coordination with the fire attack and command.
 - e. If vertical ventilation is indicated, they will proceed with this objective in coordination with command.
5. Outside Team – The Outside Vent firefighter will proceed to side Charlie and assist the 1st arriving OV with:
 - a. Giving a report from side Charlie unless it has already been done.
 - b. Performing horizontal ventilation in coordination with command.
 - c. Laddering side Charlie for a secondary egress.
 - d. Performing VEIS as needed.
6. The Driver/firefighter and OV of the 2nd arriving truck will usually assist the Driver/firefighter and OV of the 1st arriving truck unless the officer determines that they are better utilized somewhere else.
7. The Outside Team will advise their officer and command when they have completed their objectives and when moving to a new assignment.

Section 5: Squad Riding Positions and Assignments

A squad's primary responsibility is to perform truck company operations. The role they place will depend on the order of arrival of both the squad and the truck.

- If the Squad arrives prior to 1st truck, they will function as the 1st arriving truck.
- If the Squad arrives after 1st truck, they will function as the 2nd arriving truck.
- If the Squad arrives after 1st and 2nd truck, they will report to command for an assignment.
- The 1st truck to arrive will normally assume 1st arriving truck duties from the squad, which the IC may then reassign or continue to work with the truck.
- The squad will function as a truck in accordance with the prescribed procedures in this tactical manual to the extent they are limited by their apparatus and equipment.

A. Squad/Floodlight Riding Positions

1. Officer: Portable #1-retains the identity of the unit assigned; i.e., Squad-523.
2. Search: Portable #2-retains the identity of the unit and the position; i.e., Squad-523 Search
3. Outside Vent: Portable #3-retains the identity of the unit and the position; i.e., Squad-523 OV
4. Driver: Portable #4-retains the identity of the unit and the position; i.e., Squad-523 Driver
5. Extra Firefighter: This designation will be reserved for occasions that an extra firefighter rides the apparatus, regardless of where their portable is appropriated; Squad-523 Portable 5.

B. Squad Company Operations

1. 1st Arriving Squad
 - a. The Officer shall direct the Driver to position the apparatus near the incident scene in a manner that will not interfere with engine or truck positioning.
 - b. Inside Team-The Officer and Search firefighter shall proceed immediately to the front of the structure, and as a team, perform their primary objectives:
 1. Gain access for the engine company.

2. Perform primary search and rescues in those areas most likely to have trapped, viable victims. (as determined by the Squad Officer)
 3. When there is no reasonable expectation that life hazards exist, or when other crews have been assigned to search, the Officer may opt to perform other critical functions.
 4. Provide horizontal ventilation as in coordination with command.
 5. Check for extension and overhaul if necessary.
- c. Outside Team-The Driver/firefighter will operate on side Alpha and perform their primary objectives.
1. Ladder side Alpha for a secondary egress.
 2. Perform horizontal ventilation coordinated with the fire attack and command.
 3. Perform Vent Enter Isolate Search (VEIS) as needed; Driver/firefighter and OV will perform VEIS as a team.
 4. Contact command to advise them of your intention to VEIS.
- d. Outside Team-The OV firefighter will operate on side Charlie and perform their primary objectives:
1. Give a report from side Charlie.
 2. Perform horizontal ventilation coordinated with the fire attack and as command.
 3. Ladder side Charlie for a secondary egress.
 4. Perform Vent Enter Isolate Search (VEIS) as needed; OV and Driver will perform as a team.
 5. Contact command to advise them of your intention to VEIS.
 6. Back-up the Driver/firefighter.
- e. The Outside Team shall, as soon as practical, provide lighting on all sides of the structure to enhance fireground safety.

Appendix A: Hose Lays

A. Forward Lay

The operation consists of stopping the apparatus at the water supply source, permitting the hydrant person to safely leave the apparatus, and secure Humat valve at the water source. Then the apparatus proceeds to the fire, laying either single or dual lines of hose.

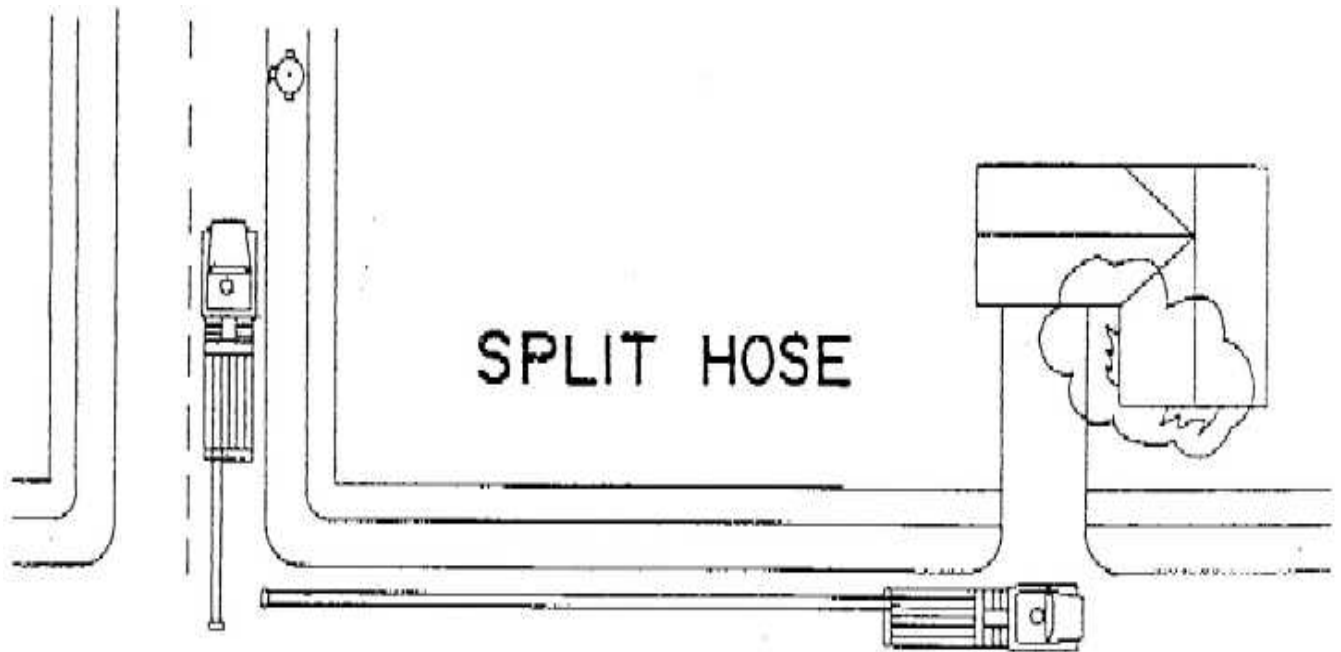
B. The Reverse Lay

The engine company leaves the appropriate appliances at the fireground and lays either single or dual lines to the water source. This engine then establishes water supply and pumps water to the fireground.

C. The Split Lay

The split lay is a supply laid, in part, as a forward lay and, in part, as a reverse lay. One engine makes a forward lay from an intersection or driveway entrance towards the fire. A second engine then makes a reverse lay to the water source from the point where the initial line was dropped. (Figure #1)

(Figure #1)



Appendix B: Humat Operations

A. The procedure for connecting a Humat valve to a hydrant is as follows:

1. Remove the Humat (hydrant wrench included) from the tailboard. Pull sufficient LDH to wrap the hydrant.
2. Wrap the LDH around the hydrant, go to left hand rear of engine and indicate to the engine driver that he/she may proceed. Do not stand near the hydrant or LDH while the engine is leading off. Do not attempt to stop the Humat or LDH if the engine drags it down the street.
3. After the engine has stopped, use the Hydrant wrench to remove the 4-12" cap from the hydrant. Check the barrel of the hydrant for foreign objects. Remove any objects.
4. Attach the Humat to the hydrant by placing its 4-1/2" female coupling flush against the 4-1/2" exposed male threads on the hydrant. Spin on the female coupling, making sure the Humat is not cross-threaded, until the Humat is securely attached to the hydrant.
5. Advise the driver via radio that you are prepared to charge the line, by asking if he/she is ready for water. Ex. "E12 – Portable-2 to E12 Mobile, are you ready for water?" If you do not have a radio, await three distinct short airhorn blasts from the engine. Do not charge the hydrant until advised to do so.
6. When advised to charge the hydrant, use the hydrant wrench to spin the hydrant's operating nut counter-clockwise. The Humat's gate should be parallel to ground until air has bled off and water starts to come out, at which point you should move the gate perpendicular to the ground which will charge the line.
7. Open the hydrant completely then spin the operating nut 1/4 turn clockwise.

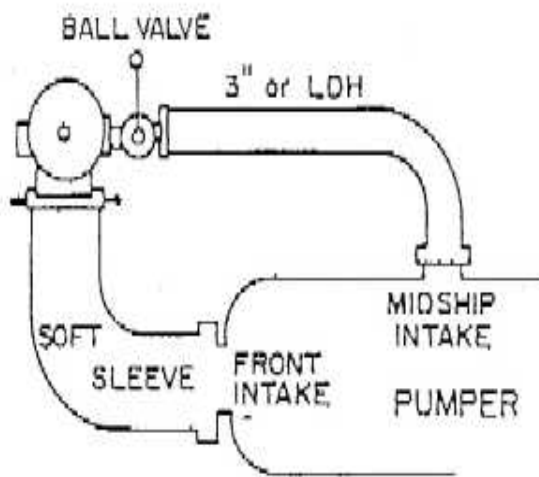
B. The following procedure shall be used to pump a Humat/hydrant:

1. Position the engine an appropriate distance from the hydrant, such that the 6" soft sleeve from the hydrant to the engine's intake will not be kinked.
2. Apply the parking brake, place engine in pump gear, and chock the engine
3. Attach the soft sleeve to the exposed 4-1/2" male threads on the Humat. Attach the other end of the soft sleeve to an intake on the engine.
4. Remove sufficient LDH from a hose bed or compartment to go from one of the engine's discharges to the intake on the Humat (directly opposing the LDH leading to the fireground). Attach this LDH to the engine's discharge and Humat.
5. Charge the discharge to which the LDH is connected, with water from the engine's tank.
6. Open the valve(s) on the intake to which the soft section line is connected.
7. Go to the hydrant and move the Humat's gate so that it is parallel to the ground. This will supply water to your engine.
8. Ascertain from the driver of the engine that you are supplying, the fire flow and estimated length of lay.
9. Adjust the discharge pressure accordingly.
10. Refill the engine's tank by thieving water.
11. A static pressure reading may be obtained by temporarily closing the LDH discharge.

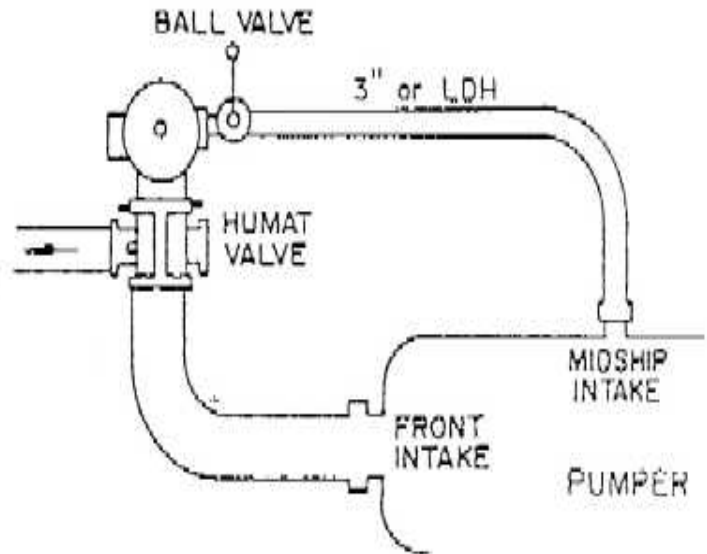
Appendix C: Heavy Water Hook Up

A. The purpose of the Heavy Water Hook-up is to provide the maximum amount of water available from a hydrant. The following procedures describe the Heavy Water Hook-up:

1. Attach the soft sleeve to the engine's intake and the 4-1/2" discharge outlet on the hydrant or Humat valve (Figures #2 and #3).



(Figure #2)



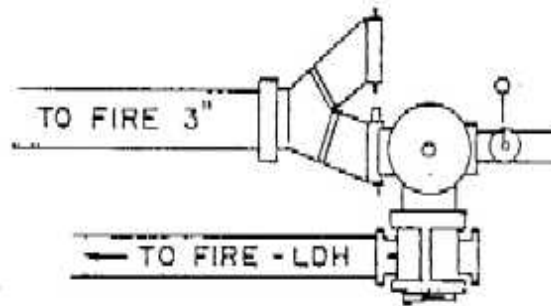
(Figure #3)

2. Put an inline ball valve with a 4" Storz to 2-1/2" reducer on the 2-1/2" hydrant outlet. If a second inline ball valve is available, also use the other 2-1/2" hydrant outlet in the same manner.
3. Connect a sufficient length(s) of LDH (or 3") from the 2-1/2" outlet(s) on the hydrant to the auxiliary pump intake(s) on the engine.
4. Remove sufficient LDH from a hose bed or compartment to go from one of the engine's discharges to the intake on the Humat (directly opposing the LDH leading to the fireground). Attach this LDH to the engine's discharge and Humat.
5. Charge the discharge to which the LDH is connected, with water from the engine's tank.
6. Open the valves on the intakes to which the soft sleeve and other supply line(s) are connected.
7. Go to the hydrant and move the Humat's gate so that it is parallel to the ground. Open the inline ball valve(s) also. This will supply water to your engine.
8. Ascertain from the driver of the engine that you are supplying, the fire flow and estimated length of lay.
9. Adjust the discharge pressure accordingly.
10. Refill the engine tank by thieving water.
11. To take a static pressure reading from the hydrant, the discharge to the LDH can be temporarily closed.

Appendix D: Laying Parallel Lines.

The following is the procedure used to lay parallel lines from a water source to the fireground, using a divided hose compartment, with LDH as the first line and 3" (or LDH) as the second supply line.

1. Stop at the hydrant, remove the LDH, Humat Valve and hydrant wrench, and wrap the hydrant with the LDH.
2. Remove the other supply line and follow the same procedure. Be sure to also remove a 2-1/2" hydrant gate and Siamese from the engine.
3. After the engine leads-off, connect the Humat to the 4-1/2" hydrant outlet using procedures outlined in Appendix B.A.4
4. Connect the hydrant gate to the hydrant to one of the 2-1/2" hydrant outlet.
5. Connect the Siamese to the other 2-1/2" hydrant outlet.
6. Hook up the second supply line leading to the fireground to the Siamese's outlet.
7. Advise the driver via radio that you are prepared to charge the lines, by asking if he/she is ready for water. Ex. "E12 – Port. 2 to E12 Mobile, are you ready for water?" If you do not have a radio, await three airhorn blasts from the engine.
8. When advised to charge the hydrant, use the hydrant wrench to spin the hydrant's operating nut counter-clockwise. The Humat's gate should be parallel to the ground until air has bled off and water starts to come out, at which point you should move the gate perpendicular to the ground which will charge the 4" line.
9. Open the hydrant completely, then spin operating nut 1/4 turn clockwise.
10. If the Siamese connection is not left at the hydrant DO NOT connect the 3" hose.
11. It is also permissible for the attack engine to drop the second line without the Siamese, allowing the supply engine to connect the 2nd line directly to his pump discharge. NOTE: 2nd line should be wrapped around hydrant as main supply line would.



(Figure #4)

Appendix E: Standpipes/Sprinklers

Note: Personnel should not interpret this section as a detailed presentation of standpipe and sprinkler systems. Additional reading and study are required to more effectively use these important tools of fire suppression.

A. Standpipe Systems Operations.

Types:

- a Dry standpipe systems require water from an external water source. An engine receiving water from a hydrant usually pumps a dry standpipe system. Dry standpipe systems are commonly found in unheated structures such as parking garages, but may also be found in older residential or commercial buildings.
- b Wet standpipe systems are supplied by a buildings domestic water system. Even though the system is “wet” and due to a required nozzle pressure, it is still necessary to augment this water supply by pumping water into the system. A building fire pump may or may not be present in a wet standpipe system. The first arriving engine company shall obtain a reliable water supply and supply the building’s fire department connection (FDC).
 - Recent events strongly suggest that fires in large buildings, particularly highrises, require greater fire flows than previously thought necessary. Therefore, provisions should be made initially for high volume water supply.
 - It shall be the policy of this Department to connect two 3" supply lines directly to the FDC unless a specific LDH connection is present. For an FDC with two inlets, the first supply line shall be connected to the FDC and charged quickly. The second supply line can then be added. The engine supplying the standpipe via the FDC should not be more than 150 ft. away from the connection.
 - The engine supplying an FDC will be dedicated to that task alone. No additional attack or supply lines will be used from that engine.
 - The engine supplying the standpipe shall maintain a pump pressure of 150 psi. plus 5 additional psi. for each floor from the ground level to one floor above the fire floor. The maximum engine pressure shall not exceed 200 psi. Companies operating (2)-stage fire pumps should use the stage of the pump that is most efficient for the engine pressure required.
 - Sprinkler systems are supplied by the domestic water supply. Sprinkler systems must be supported by an engine company. Engine Company should connect at least 2-3" lines to the Fire Department Connection (FDC).
 1. FADO shall charge at least one of the 3" supply lines to the FDC.
 2. The FADO shall maintain an engine pressure of 150 psi.
 3. If the demand for water is greater than one line can supply, the 2nd line shall be charged.
 4. If the engine is equipped with a two stage pump it must be pumped in volume to have the required flow.
 - If supplying a dry standpipe system, it may take several minutes before the system becomes filled with water to the point pressure can be generated.
 - To eliminate the impact of a closed O, S & Y valve or other system problem, consideration shall be given to connect a 3" supply line to the lowest standpipe outlet in the designated attack stairwell. This shall be accomplished by the Pump Operator of the 2nd or later arriving engine company.
 - The pump operator who is responsible for supplying a standpipe, should remain alert to changes in fire flow and/or pump pressure.
 - When operating at highrises extreme care should be taken by pump operators supplying standpipes, due to the danger of falling glass and other objects from the fire building. This can result in injuries to members and damage to hose lines.
 - Consideration should be given to obtaining plywood to protect supply lines. (USAR 17 can be utilized for this plywood.)

B. Standpipe operations on the fire floor.

- Standpipe operations present a significant challenge, are manpower intensive, and require a high level of coordination between all crews involved.
- Consideration should be given for utilization of a smooth bore nozzle on high-rise/standpipe packs not only for the benefit of reach, lower required nozzle pressure, and less nozzle reaction, but most importantly because they can pass sediment and debris that is often found in standpipe systems. This debris can and will clog up a fog nozzle if present in the system.
- To prevent an overextension of resources and to facilitate a smooth operation, two engine companies shall be paired up to place a single attack line in service. The first and second arriving engine companies, as well as any additional company assigned to place an attack line in service, will carry with them their standpipe hose pack(s) and equipment.
- Companies shall utilize the stairs if not properly trained in the elevator's Fireman's Service feature, if there is smoke present in the elevator shaft, or if the fire is located on or below the 7th floor.
- When using the stairs to reach the fire floor, crew members should examine the standpipe for open valves as ascent is made.
- Initial crews shall verify the fire floor and, if possible, the apartment location on the fire floor (by locating the same apartment on the floor below). Once completed, an attack stairwell shall be determined and communicated to the Incident Commander.
- Connection of the attack line to the standpipe shall occur on the floor below the fire.
- Ensure enough attack hose has been assembled to make the fire apartment or location. It is not uncommon for stretches of 200' or more in some standpipe equipped buildings.
- Before connecting any device to a standpipe, the opening should be checked for foreign objects. Members may also find a Pressure Reducing Device, such as an orifice disc, that will reduce the effectiveness of hose streams unless they are removed. If such devices are found, the Incident Commander shall be notified immediately of their presence.
- A gated appliance should be placed between the standpipe and the attack line. The present high rise packs contain both a gated-wye and a short length of 3" hose to facilitate such a connection. These gated appliances can be used to produce an effective fire stream by controlling the pressure on the attack lines.
- The officer in charge of the initial attack line shall determine the method of hoseline deployment. If the door to the fire apartment is closed and the hallway is relatively clear and tenable, a "hallway stretch" shall be utilized. If the door to the fire apartment is open and the hallway is smoky and untenable or there is fire in the hallway, then a "stairwell stretch" shall be utilized.
- Hallway Stretch – An attack line is deployed as a dry line to the fire apartment door, making sure all kinks are removed and there is sufficient hose in the hallway to cover the fire apartment. The attack line is charged and bled prior to entry.
- Stairwell Stretch – An attack line is flaked out in the stairwell and, the floor below, making sure all kinks are removed. The attack line is charged and bled. Advancement is then made with the charged attack line down the hallway to the fire apartment.
- Consideration shall be given to forcing the door of an adjacent apartment as an emergency area of refuge prior to entering the fire apartment. A door on the same side of the hallway as the fire apartment and between the fire apartment and attack stairwell is ideal.
- Officers should keep in mind that a significant fire will require more than one attack line; additional lines may have to be stretched a greater distance. Provisions should be made to extend attack lines using larger diameter hose lines.
- The use of 2-1/2" hose lines with 1 1/4" tips, and/or the use of master stream devices, may be necessary to suppress fires in high-rise buildings.
- In the event of a significant or wind-driven fire, where crews cannot confine and extinguish the fire using an interior attack, consideration shall be given to application of exterior streams. If such an order is given, it will not be carried out until the fire floor has been cleared of all personnel and the "all clear" given.

Appendix C-5:
Tactical 09
MAYDAY
Procedures

S.O.P. #: Tactical Operations #09

SUBJECT: MAYDAY Procedures

DIVISION: Emergency Operations

Objective: To provide a uniform means of notifying the Incident Commander that one or more Fire Service personnel are lost, trapped, or ill in a life-threatening environment.

Section 1: Purpose

1. The purpose of this policy is to establish procedures to follow during a MAYDAY situation.
2. Fire Service personnel should remember that early notification of your situation is the key to survival. Personnel should not hesitate to notify Command that they are in need of assistance.
3. The intent of this policy is to make abundantly clear the need for rescue of fire service personnel. This policy delineates the difference between other terms used such as Emergency Traffic, urgent, and others that should not be confused with Fire Service personnel needing rescue.

Section 2: Definition

1. A MAYDAY is a special term, which indicates that one or more Fire Service personnel are in a life-threatening situation and need immediate help.
2. **MAYDAY, MAYDAY, MAYDAY** will be the radio term used to notify the Incident Commander that personnel are lost or trapped, or in need of immediate medical assistance within the environment where LIFE THREATENING CONDITIONS (S) may exist.
3. Examples of a MAYDAY situation include; lost or disoriented, sudden chest pains or trouble breathing in a fire suppression operation, low air alarm with no egress point, trapped in a collapse, etc.
4. When a PASS Device has been activated for more than 1 minute within the area where Life Threatening Condition(s) may exist, it will be treated as a distress signal and Command will determine the need for a MAYDAY.
5. The activation of the Emergency Button on the portable radio from a **unit on location**, will be treated as a MAYDAY until proven otherwise.
6. Personnel Accountability Report (PAR) – A report given by a company officer or member indicating whether or not the officer or member has visual contact with the remaining members of their crew.

Section 3: MAYDAY Transmittal Procedure

1. Any personnel becoming lost, disoriented, or trapped that can contact Command shall utilize the term **MAYDAY, MAYDAY, MAYDAY**.
2. Personnel declaring a MAYDAY shall provide the following information if possible. The acronym **LUNAR** shall be utilized:
 - Location
 - Unit Number
 - Name
 - Assignment
 - Resources needed for rescue
3. If possible personnel should activate their Emergency Button on the portable radio.
4. Once personnel have called a MAYDAY and provided the information needed (LUNAR), they will activate their PAS Device manually, and intermittently.
5. In the event personnel are unable to communicate via radio, they shall activate the PASS Device **manually**, and intermittently, for periods of at least 1 minute (this will establish a MAYDAY vs. the pre-alert for inactivity).

S.O.P. #: Tactical Operations #09

SUBJECT: MAYDAY Procedures

Section 4: Command Procedures

1. Upon receipt of a MAYDAY **only** radio traffic specific to the MAYDAY situation shall occur. The Incident Commander will control all radio communication. In the event critical information must be passed to Command, personnel may provide that information.
2. The Incident Commander shall announce or cause to be announced the MAYDAY situation.
3. In the event a MAYDAY is received via radio and the personnel needing assistance can and have provided the LUNAR information, an immediate PAR will not be necessary. However, in the event personnel are not able to communicate the LUNAR information, the Incident Commander will conduct a PAR of all units functioning in the Life Threatening environment.
4. Once a MAYDAY has been declared, Company Commanders will conduct an immediate PAR of their personnel. The only notification necessary to Command from Company Officers will be if they are missing personnel.
5. If deemed necessary, the Incident Commander may utilize additional Tactical Talkgroups for non-MAYDAY/RIT operations. It should be noted that at no time should the crew involved in the MAYDAY be switched to an alternate Talkgroup.
6. Command shall provide periodic Brief Progress Reports to Dispatch to include the RIT operation(s).
7. Command shall notify Dispatch of the conclusion of the MAYDAY event.

Section 5: Dispatch response to a MAYDAY

1. Dispatch will assign an additional alarm to the incident. This will be either a second alarm or an additional alarm, designated to be resources that will be available for the incident commander to deploy.
2. Dispatch shall assign a specific Operator to monitor the Talkgroup during a MAYDAY event.
3. In the event a MAYDAY is declared or a crew involved in the MAYDAY inadvertently communicates on an unassigned Talkgroup, Command shall be advised and the dispatcher will remain with the MAYDAY crew on that Talkgroup.
4. Dispatch shall immediately notify Command of a Radio Emergency Button activation from any unit on the scene. Dispatch will provide all the pertinent radio designation information to the incident commander.

Appendix C-6:
Tactical 18
Rapid Intervention
Team

S.O.P. #: TACTICAL OPERATIONS #18

SUBJECT: RAPID INTERVENTION TEAM

DIVISION: EMERGENCY OPERATIONS

Scope: The Baltimore County Fire Department puts the utmost priority on the safe and effective mitigation of all emergency incidents. This includes the safe return of all members following a response. This SOP will serve as a tool to provide for safe and effective operations during emergency incidents.

Section 1: Purpose

1. The purpose of this SOP is to establish command and operational procedures to provide a means to rapidly assist Fire Service Personnel who may become lost, trapped, or in need of immediate medical assistance while operating at emergency incidents.
2. This SOP will apply to all incidents that require Fire Service Personnel to enter and function in an environment that is Immediately Dangerous to Life and Health (IDLH).

Section 2: Definition

1. MAYDAY, MAYDAY, MAYDAY – will be the radio term used to notify the Incident Commander that Fire Service Personnel are lost, trapped, or in need of immediate assistance, where life threatening conditions may exist. Such a situation will be referred to in the text of this SOP simply as a “MAYDAY”.
2. LUNAR – (Location, Unit number, Name, Assignment, Resources needed for rescue) The acronym used to remember the necessary information to be relayed to the Incident Commander when reporting a MAYDAY.
3. Immediately Dangerous to Life and Health (IDLH) –“Any condition that poses an immediate or delayed threat to life or that would cause irreversible adverse health effects or that would interfere with an individual’s ability to escape unaided from a dangerous atmosphere.” (NIOSH/29 CFR* 1910.120)
4. Rapid intervention Team (RIT) – Will be a company of at least 4 entry level (white tag) Fire Service Personnel established, equipped, identified, and solely committed to the locating of and rescuing of lost/trapped firefighter (s).
5. Rapid Intervention Task Force (RITF) – Will consist of the next due: Engine Company, Truck or Rescue Company, and an Advanced Life Support Medic Unit.
6. Incident Commander (IC) – Is the individual responsible for overseeing and coordinating the incident operation.
7. Personnel Accountability Report (PAR) – A report given by a company officer or member indicating whether or not the officer or member has visual contact with the remaining members of their crew.
8. Personnel Alert Safety System (PASS) – The alerting system common to Self Contained Breathing Apparatus assemblies to indicate by audible tone a motionless or distressed Fire Service Personnel.
9. 2-In/2-Out – Simply stated is the federally mandated procedure by which initial crews operate in a buddy system and maintain at least a two person, equally trained, and equally equipped team dedicated to rescue/assistance of the minimum of two person initial attack crew (See Tactical SOP #6)

Section 3: Command Procedures

1. The Incident Commander will ensure that a crew is assigned the sole responsibility of RIT.
 - a. The Fourth Engine to arrive on the scene will be assigned/designated the RIT; this does not prevent the Incident Commander from assigning earlier arriving companies or additional companies to the RIT.

- b. Rapid Intervention Team(s) will not be reassigned to any other non-critical function until relieved by adequate replacements. The IC will have a RIT team established within the first alarm, which will relieve the initial “2 out” requirements, of the “2in/2out” policy.
2. The Incident Commander and/or the RIT Group Officer will develop a RIT Action Plan. The Incident Commander will redirect the incident to fulfill the priorities of the RIT Action Plan.
3. The Incident Commander will ensure that all radio traffic is strictly monitored/controlled.
4. The Incident Commander will deploy the RIT to the last/best known location of the lost/trapped firefighter(s).
5. The Incident Commander will assign replacement RIT(s). (Ensure that a RIT Task Force is enroute)
6. The Incident Commander/RIT Group Officer will ensure that a separate RIT apparatus staging area is established, and all companies assigned to RIT will report to this area. (RIT companies should not be sent to Level 2 Staging Areas)
7. The Incident Commander will appropriately expand the IMS organization.

Section 4: Rapid Intervention Task Force

1. The Rapid Intervention Task Force (RITF) will consist of the next due: Engine Company, Truck or Rescue Company, and an Advanced Life Support Medic Unit. This assignment is in addition to the first or greater alarm assignment, and is an addition to the second alarm (if called prior to the “working fire” upgrade).
2. The Engine Company, Truck or Rescue Company, and Advanced Life Support Medic Unit from the Working Fire Dispatch will be considered the Initial RITF.
3. The need for a RITF response will be based on the Incident Commander’s judgment of the incident conditions. The Incident Commander should be proactive in assessing the potential for a MAYDAY situation to occur.
4. The RITF will automatically be dispatched in addition to the additional alarm for a Mayday declaration (if not already on the assignment). (see Mayday SOP)
5. The RITF will be automatically dispatched in addition to the Second Alarm assignment (if not already on the assignment i.e., “working fire”). The RITF will be identified and dispatched first, then the additional alarm will be identified and dispatched.
6. The Incident Commander may at any time request the dispatch of a RITF or multiple RITFs.
7. The RITF will be assigned as/to the RIT Group, and will be utilized to enhance the rescue capabilities of the initially assigned RIT.

Section 5: Rapid Intervention Group Officer Responsibilities

1. The RIT Group Officer will be identified as “RIT Group”.
 - a. Until a RIT Group Officer is designated by the Incident Commander the company officer of the initial RIT will assume the RIT Group Officer responsibilities.
2. The RIT Group Officer shall confer with the Incident Commander and Initial RIT to obtain the current situation status.
3. The RIT Group Officer will also work with the on-scene Safety Officer(s) to assess potential life-threats and scene hazards that need to be mitigated. Access and egress points will be a part of the dynamic process that the RIT team will continually evaluate.
 - a. The Safety Officer will also assess (and advise the IC) of RIT deployment to make sure adequate coverage of RIT teams if provided.
4. The RIT Group Officer will as soon as possible/practical establish RIT Entry Control.
5. A RIT Action Plan shall be developed by the RIT Group Officer to include the search parameters for lost/trapped firefighter(s). (See Appendix D)
 - a. LUNAR
 - b. Listen for potential radio communications from lost/trapped firefighter(s)
 - c. Listen for PASS unit activation
 - d. Information from other operating units
 - e. Use of Thermal Imaging equipment
 - f. Physical search
6. The RIT Group Officer will assign companies to Objective Based Deployment tasks.

- a. Locate and maintain
- b. Extrication
- c. Resources
7. The RIT Group Officer will initiate actions to place, or have placed protective hoselines, and establish or have established ventilation in areas where Fire Service Personnel may become trapped.
8. The RIT Group Officer will identify support needs and request additional resources (i.e. Collapse Teams, ATR, Haz-Mat) from the Incident Commander.
9. The RIT Group Officer will review, further develop, and implement the RIT Action Plan.
10. The RIT Group Officer will assess the need for additional relief crews to be assigned to the RIT Group, and stage them outside the Tool Staging area.

Section 6: Rapid Intervention Team Operational Procedures

1. The establishment of a full (4 person) RIT will relieve the initial "2 out" requirements, of the "2 in/2 out" policy.
2. The Fourth Engine to arrive on the scene will be assigned the RIT:
 - a. This does not prevent the Incident Commander from assigning earlier arriving companies or additional companies to the RIT as long as it is established as part of the first alarm.
 - b. The establishment of the RIT shall be based on entry into an IDLH or potential IDLH atmosphere.
3. Once established, the radio designation of the RIT will be "RIT Group". Upon establishment of the RIT Group, companies assigned to the RIT group will maintain their usual identity. i.e. E-6 to RIT Group, S-303 to RIT Group, M-5 to RIT Group).
4. Planning requirements of the RIT:
 - a. Conduct size-up of the structure or area, utilize pre-plan information when and if available, (See Appendix A)
 - b. Confirm location of all units working in the IDLH environment,
 - c. Determine all access points into the structure, and the most rapid access to the hazard area(s) including but not limited to:
 - Placement of ground ladders,
 - Exit Illumination (lighting of egress areas)
 - Forced entry points,
 - Plan where to acquire and deploy protective hose-line if needed for rescue,
 - Recommend to the Incident Commander what action(s) should be taken to improve entry & egress based on the above information.
 - d. Establish tool staging area for RIT tools, (See Appendix C)
 - e. Begin to develop the RIT Action Plan, (See Appendix D)
 - f. Monitor all radio traffic on the fire ground.
 - g. Assign crew deployment responsibilities.
5. The focus of the initial RIT during Deployment is to:
 - a. Search, recon, and locate lost/trapped firefighter(s),
 - b. Evaluate and/or provide an air supply and emergency care to lost/trapped firefighter(s),
 - c. Remove the lost/trapped firefighter(s) if possible,
 - d. Communicate with the Incident Commander/RIT Group Officer on resources needed to protect and/or remove the lost /trapped Fire Service Personnel.
6. Additional companies assigned to RIT will prepare for Objective Based Deployment tasks.
 - a. Locate and maintain
 - b. Extrication
 - c. Additional resources

Section 7: Downed Firefighter Location and Assessment Procedures

1. After locating lost/trapped firefighter(s), the deployed RIT will have to perform a quick assessment of the located firefighter(s) to determine if rescue is possible, or if they must protect in place. The Assessment procedure is as follows:
 - a) Upon locating the lost/trapped firefighter(s) deactivate the PASS device. Attach a lifeline to located firefighter(s);
 - b) Immediately notify the Incident Commander and/or RIT Group Officer that the lost/trapped firefighter(s) have been located. Provide the location and status of all Fire Service Personnel;
 - c) Air supply is the number one priority, therefore, determine how much air the located firefighter(s) have left, and review your options:
 - Guide located firefighter(s) out of building if possible,
 - Secure to spare SCBA and make your Exit,
 - Exit using the RIT BAG,
 - Exit while using the EBSS (buddy-breathe),
 - Use Confined Space Air Cart.
 - d) Sweep the perimeter of the bodies of all located firefighter(s) to determine if they are entangled or trapped, and review your options:
 - Disentangle the located firefighter(s), (be cautious of cutting electrical wires)
 - Remove the entrapment if possible,
 - Protect in place, and advise the Incident Commander and/or the RIT Group Officer of this decision, as well as what resources are needed to affect the rescue.
 - e) Exit with the located firefighter(s), or stay with them until replaced by, or assisted by another RIT.
 2. A search line should be deployed directly to the location of the located firefighter(s). This will allow for a rapid exchange of crews protecting the located firefighter(s). If this lifeline is attached to the lost/trapped firefighter(s) (as in Section 1a) you will have to manage/or remove this lifeline during the removal process.
 3. If a hoseline is needed to provide for protection during the rescue and removal use caution when flowing water. Consider the added weight, as well as runoff issues pertaining to the rescue. Sump pumps may be needed to assist in controlling flooding water.

Section 8: Tool Staging Area

1. A Tool Staging Area will be established for all RIT Operations by the initial RIT;
2. The Tool Staging Area should be positioned in an area that allows the quickest access to where potential problems have been forecast through the size-up;
3. The Tool Staging Area will be increased as the RIT Operation escalates;
4. If multiple RIT(s) are established because of geographical reasons, there should be a Tool Staging Area for each RIT;
5. The Tool Staging Area is designated by the orange RIT tarp. The RIT will gather the tools needed, based on the RIT size-up, and place them on the Tarp. Tools on the RIT Tarp will be for use by the RIT only.
(See Appendix C)

APPENDIX A
RIT SIZE-UP CHECK LIST

Gather the following information about the Incident:

Time of dispatch: _____
Arrival time of 1st Crew/s on scene: _____
Estimated time of crew Entry: ___
Fire Conditions Upon Entry: _____

Gather the following information about the building:

Occupancy type: _____
Building size: _____(L)x_____ (W)x_____ (H)
Building Construction: _____
Utilities Controlled ? YES / NO
Concerns: _____

Gather the following information about crews operating on the Incident:

1st Engine #____, Assignment:_____, Location:_____, INT/EXT
2nd Engine #____, Assignment:_____, Location:_____,
INT/EXT 1st Truck #_____, Assignment:_____,
Location:_____, INT/EXT 2nd Truck #_____,
Assignment:____, Location:_____, INT/EXT 3rd Engine #____
_____, Assignment:_____, Location:_____,
INT/EXT 4th Engine #_____,
Assignment:____, Location:_____, INT/EXT

Check status of Means of Egress for ALL crews operating on the incident;

Confer with the Incident Commander on Incident Priorities, Strategies, and Tactics

Set-up Tool staging Area;

Monitor fireground talkgroups and track best known whereabouts for ALL crews;

Be prepared for deployment during ALL stages of the Incident:

Crew deployment responsibilities:

____Tool FF;____RIT Bag FF;____Rope Bag FF;____T.I.C. FF/Officer

APPENDIX B

RIT BAG INVENTORY

1-Scott RIT Bag;
1-Scott SCBA Frame;
1-Scott SCBA hose w/ multiple connectors; 1-
Large Facepiece;
1-MMR Pigtail;
2- Green Strobe lights;
1 Bright Orange RIT tarp 4-
Carabiners;
4-Rescue Straps; (20' Tubular Webbing Sling)
1-Sling-Link (MAST) Rescue Strap;
2-Single Pulleys;
5- Lime Green Light sticks;
1pr- Linesman Pliers (Spring loaded);
1- Stopwatch;
1-Laminated RIT Size-up Check List;
1-Laminated Tool Staging Area Check List;
1-Laminated RIT Bag Inventory Check List;
1-Laminated RIT Action Plan Check List;
1-Laminated RIT Entry Control Worksheet.

APPENDIX C

TOOL STAGING AREA CHECK LIST

RECONNAISSANCE TOOLS: (NEEDED IMMEDIATELY)

1-Bright Orange RIT tarp; 1-
RIT BAG;
1-Thermal imaging camera; 1-
Master search rope
4-Personal search ropes 2-
Axes;
2-Halligan Tools;
2-Handlights;
Access to a hoseline if/when needed.

RESCUE TOOLS: (NEEDED AS INCIDENT & RIT EFFORT ESCALATE)

More hand-tools;
Stokes Basket;
Chainsaws
Circular saws (gas/electric);
Hydraulic/Pneumatic rescue tools; Port-o-
powers;
Confined space Air-Carts;
Other ATR equipment.

APPENDIX D

RIT ACTION PLAN

Complete RIT Size-up Check-list:

1) Update at each transfer of RIT Group Officer.

Ensure Tool Staging Area is Progressing as needed;

Request resources to fulfill needs identified through the
Size-up.

1) Back-up Hoselines,

2) Ventilation.

Monitor Fire-ground Radio Traffic to prepare for any Potential Deployment.

Monitor Egress points for:

1) Forcible Entry Requirements,

2) Needed Ladders,

3) Exit Illumination,

4) Advise IC/RIT Group of actions and/or resources needed.

As Soon as Possible Begin RIT Entry Control
Worksheet;

Establish Primary and Secondary Plan of Attack

1) Based on priorities forecast through the Size-up

Appendix C-7: SOP
400-27A
Respiratory
Protection Program

S.O.P. #: 400-27A

SUBJECT: RESPIRATORY PROTECTION PROGRAM

DIVISION: EMERGENCY OPERATIONS

Objective: To establish a Respiratory Protection Program for all work areas of the Department that contain or potentially contain hazardous atmospheres to which employees/members could be exposed. To fully comply with all applicable codes, regulations, and standards pertinent to respirator use for the Department including, but not limited to, OSHA 29 CFR 1910.134 Respiratory Protection.

Section 1: Definitions

- A. **Air-purifying respirator** means a respirator with an air-purifying filter, cartridge, or canister that removes specific air contaminants by passing ambient air through the air-purifying element.
- B. **Licensed Health Care Professional (LHCP)** means a physician employed or under contract to the Baltimore County Government. The physician shall be familiar with the operations and operational environment of the Department and with the Respiratory Protection Program.
- C. **Immediate Danger To Life or Health (IDLH)** means an atmosphere that poses an immediate threat to life, would cause irreversible adverse health effects, or would impair an individual's ability to escape from a dangerous atmosphere.
- D. **Interior Structural Firefighting** means the physical activity of fire suppression, rescue or both, inside of a building or enclosed structures, which are involved in fire beyond the incipient stage.
- E. **Member** means any career employee of the Baltimore County Fire Department, or any volunteer of an incorporated body that is a member of the Baltimore County Volunteer Firemen's Association.
- F. **Self-Contained Breathing Apparatus (SCBA)** means a **Baltimore County** authorized, atmosphere supplying respirator for which the breathing air source is designed to be carried by the user.
- G. **Supplied-Air Respirator (SAR) or Airline Respirator** means an atmosphere supplying respirator for which the source of breathing air is not designed to be carried by the user.
- H. **Air Administrator** – the Safety Officer of the Baltimore County Fire Department is the designated Air Administrator.

Section 2: Responsibility

- A. The Air Administrator is responsible for the overall administration and management of the Respiratory Protection Program.
- B. The Battalion/Division Chief of the Fire-Rescue Academy is responsible for developing and conducting the training components of the Respiratory Protection Program.

- C. The Safety Officer is responsible for assuring the maintenance of respirators and associated equipment in addition to conducting FIT testing as required.
- D. All members are required to comply with the specific requirements of the program.

Section 3: Objectives

- A. Ensure that members are protected from respiratory hazards that are or may be encountered in the performance of their duties.
- B. Ensure that members using respirators follow required procedures.
- C. Ensure that members are adequately trained and proficient in the use of respirators.
- D. Ensure that members are medically evaluated before using respirators.
- E. Ensure that all respirators used by Department members meet the requirements of NIOSH Respirator Certification Requirements 42 CFR Part 84 and are appropriate for the hazards to which the user may reasonably be expected to be exposed. SCBA shall also meet the requirements of NFPA 1981 – Standard on Open Circuit Breathing Apparatus, at the time of purchase.
- F. Ensure that all respirators are regularly inspected, properly maintained, cleaned and sanitized.
- G. Ensure that SCBA are provided with air that meets recommended standards.
- H. Ensure that only County authorized SCBA units are used within the Department.
- I. Ensure that the Respiratory Protection Program is reviewed annually, evaluated, and revised as necessary.

Section 4: Use of Respirators

- A. Policy for Use
 - 1. All members shall use respiratory protection when they may be exposed, or potentially exposed, to respiratory hazards that are an IDLH.
 - 2. All members who perform interior structural firefighting must be currently qualified to use SCBA.
 - 3. All members who are or could be exposed to IDLH atmospheres during fire suppression operations and/or training exercises shall use SCBA. This includes:
 - a. All interior structural firefighting operations
 - b. Interior and/or exterior exposure to smoke or other products of combustion
 - 4. SCBA or SAR shall be used by members exposed, or potentially exposed, to IDLH atmospheres at all types of incidents or training exercises including, but not limited to:
 - a. Oxygen deficient atmospheres

- b. Carbon monoxide incidents
 - c. Confined space rescue operations
 - d. Hazardous materials incidents
5. Members operating in the vicinity of known or potential IDLH atmospheres, who may be required to enter the IDLH area, shall wear SCBA or have SCBA or SAR available for immediate donning and use.
6. Air purifying respirators (filter masks) may be used to provide respiratory protection in situations where SCBA use is not required. This includes, but is not limited to:
- a. Protection from asbestos particles during salvage, overhaul, and fire investigation
 - b. Certain hazardous materials incidents
 - c. Dust producing activities
7. Air purifying respirators shall not be used in areas that are or have the potential to become IDLH or oxygen deficient atmospheres.
8. The particular filter media (filter or chemical canister) to be utilized must be selected for the specific application.

B. Training Policy

1. All members who are expected to perform interior fire suppression operations and all members who are expected or may reasonably be expected to operate at emergency incidents in IDLH areas that involve respiratory hazards shall be qualified to use SCBA.
2. Members shall not use air purifying respirators in hazardous atmospheres or at emergency incidents unless they have been trained and qualified to use the specific type and model of respirator.
3. The initial qualification to use respirator requires:
- a. Medical evaluation
 - b. Fit Testing
 - c. Training
 - d. Demonstration of proficiency
4. Members must qualify annually to use air purifying respirators. Qualification requires:
- a. Annual refresher training
 - b. Fit test
 - c. Demonstration of proficiency
5. The Battalion/Division Chief of the Fire-Rescue Academy shall maintain the records of members who are qualified to use each type of respirator.

C. Availability

1. An adequate number of approved SCBA shall be provided on each fire suppression vehicle for crew members who are expected to perform interior fire suppression operations and/or may reasonably be expected to operate in an IDLH atmosphere.

2. At the discretion of the Fire Chief, additional SCBA's may be provided to ensure that one is available for each member. This includes extra SCBA's provided for:
 - a. Staff and command vehicles
 - b. Special use vehicles
 - c. Training
 - d. Replacement of units that are out of service for maintenance or repairs
3. At least one spare air cylinder shall be carried on each fire apparatus for each SCBA assigned to that vehicle. Additional spare air cylinders and/or refilling capabilities shall be provided for long duration incidents.
4. Respirators carried on apparatus for the use of crew members shall be secured in brackets and be stored in a manner that protects the regulator openings and facepiece from contamination by road dirt, dust, or weather conditions. Additional respirators shall be stored in enclosed compartments and/or carrying cases.

Section 5: Respirator Selection

- A. The approved standard respirator used by the Baltimore County Fire Service for fire suppression and other emergency operations shall be the Scott Air-Pak Model 4.5 self-contained breathing apparatus. All members exposed to IDLH or potential IDLH atmospheres shall use this respirator. This unit may be used with 30-minute to 60-minute rated air cylinders.
- B. Only approved supplied air respirators (airline breathing apparatus) may be used in IDLH or potential IDLH atmospheres. Supplied air respirators are reserved for special applications requiring long duration and/or reduced weight and bulk, including confined space rescue and hazardous materials incidents. These units shall only be used by members who have been trained in their use and who have demonstrated proficiency .
- C. The use of other respirators may be authorized, in writing, by the Fire Chief or his/her designee and be based on a detailed review of the specific situation and the alternatives that are available.

Section 6: Medical Evaluation

- A. Initial Evaluation
 1. Each member shall be required to fill out a medical evaluation form that will be evaluated by the Licensed Health Care Professional (LHCP), or its agent, before being authorized to use a respirator. The LHCP, or its agent, shall issue a written recommendation that the member is medically qualified to use a respirator and to engage in emergency operations before the member shall be permitted to be fit tested or to use a respirator in a hazardous environment.
 2. A confidential medical file shall be maintained for each member under the control of the medical provider. The LHCP's recommendation shall be maintained in the member's file. A copy of the LHCP's recommendation will be provided to the member. The member will have the opportunity to discuss the recommendation with the LHCP.

3. Due to the nature of emergency operations, members must obtain the approval from the LHCP for unrestricted SCBA use before being authorized to perform fire suppression or other emergency activities that require respiratory protection.

B. Re-evaluation

1. Members shall be re-evaluated for respirator use by the LHCP if:
 - a. The member reports medical signs or symptoms relating to his/her ability to use a respirator to a supervisor or to the Baltimore County Fire Department Physician.
 - b. Responses to items in the medical questionnaire indicate the need for re-evaluation.
 - c. The supervisor has reason to believe that the member requires further medical evaluation or requires a member to be re-evaluated for any other reason.
 - d. There is significant change in the member's work conditions related to respirator use.
2. Members who are scheduled for a full physical examination by the LHCP shall also have their status for respirator use reviewed at that time.

C. Confidentiality of Records

1. The questionnaire is a confidential medical record and the responses shall only be reviewed by the LHCP or a qualified medical professional working under the direction of the Baltimore County Government. If the need for a medical re-evaluation is identified, the member will be notified by the LHCP. The Fire Chief will be notified, and the member's authorization to use a respirator will be evaluated on a case by case basis until the medical re-evaluation has been completed.

Section 7: Fit Testing

A. Test Requirements

1. After completing the medical evaluation, each member shall successfully complete a quantitative fit test in accordance with Appendix A of 29 CFR 1910.134 before being authorized to use SCBA or other respirators in a hazardous or potentially hazardous atmosphere.
2. Fit testing shall be conducted as part of the initial training program and for all respirator training programs by individuals who have been trained and are qualified to use the fit testing apparatus. The fit test records will be forwarded to and maintained by the Baltimore County Fire Department Air Administrator.
3. Additional fit testing may be required if:
 - a. The member reports changes in his/her physical condition or problems maintaining a seal during respirator use.
 - b. Recommended by a supervisor or the Baltimore County Fire Department Physician.
 - c. A new or different type of facepiece is to be used by the member.

B. Use Requirements

1. Members shall only use the type and size of facepiece that was used when completing the fit test.
2. Each member will be provided an individual facepiece.
3. Members who have a beard or facial hair (more than two day growth) that impairs the sealing surface of the facepiece that could interfere with the operation of the unit, shall not be permitted to use respiratory protection at emergency incidents, or in IDLH or potentially IDLH atmospheres. Under no circumstances will members with facial hair be permitted to take the fit test.
4. Nothing shall be allowed to enter or pass through the area where the respirator facepiece is designed to seal with the face, regardless of any specific fit test measurement that can be obtained. Members who need eyewear inserts shall be provided them after evaluation at the employee's expense.
5. Before entering a hazardous atmosphere, members will perform a self-check of the facepiece seal when donning the SCBA.

Section 8: Training

A. Initial Training

1. All members who are expected to perform fire suppression operations and/or other emergency activities shall be trained and certified in the use of SCBA. Training and certification shall occur prior to being authorized to participate in emergency incidents, training exercises, or other activities that involve respiratory hazards.
2. Members who are expected to use other types of air purifying respirators shall be trained in the use of that specific equipment and demonstrated proficiency before being authorized to use it.
3. The initial training shall ensure that the member is thoroughly familiar with the respirator and has used it in a non-hazardous environment. The initial training shall address:
 - a. Why the respirator is necessary and how improper fit, use, or maintenance may compromise its protection.
 - b. Capabilities and limitations of the respirator.
 - c. Inspection, donning, doffing, seal checking, and normal use of the respirator.
 - d. Emergency procedures, including situations that involve malfunction of the respirator, maintenance, and storage procedures.
 - e. Recognition of medical signs and symptoms that may limit or prevent effective use of the respirator.
 - f. The general requirements of 29 CFR 1910.134, Respiratory Protection.
4. Each member will demonstrate the proper procedures for:
 - a. User inspection of the respirator
 - b. Donning of the respirator, including the seal check
 - c. Confident in use of the respirator
 - d. Emergency procedures

e. Doffing, cleaning, and maintenance of the respirator

B. Annual Refresher Training

1. Each member who is authorized to use SCBA or other respirators shall participate in an annual refresher training and re-qualification program. The refresher training shall ensure the member is able to meet the objectives listed for initial training and provide any new information that is required. Each member will also demonstrate the same skills as required for initial training program.

C. Training Records

1. The Battalion/Division Chief of the Fire-Rescue Academy will maintain the training records of all members who have been initially trained, certified to use respirators, and the records of annual refresher training. The annual refresher training records include a record that the annual fit test has been conducted and that the medical questionnaire has been completed and submitted to the LHCP.
2. Company Commanders (Career and Volunteer) shall ensure that all career and volunteer members maintain their qualifications to use respirators.

Section 9: Maintenance and Inspection

A. Inspection

1. Respirators shall be maintained in good working order and in a clean and sanitary condition. Units that require maintenance or repairs shall be removed from service and tagged to prevent inadvertent use.
2. Regular inspections of respirators shall be conducted in accordance with the following schedule:
 - a. SCBA carried on in-service apparatus for the regular use of crew members shall be checked daily.
 - b. SCBA and spare air cylinders carried on apparatus, including reserve apparatus, command and staff vehicles, shall be checked weekly.
 - c. SCBA reserved for training and spare units shall be checked before each use and before being placed in regular service.
 - d. Other types of respirators shall be checked weekly and before each use.
 - e. All respirators shall be checked after each use, after cleaning and servicing, and before being placed back in service.
3. Respirator inspections shall follow the manufacturer's recommended procedures. Regular user inspections of SCBA shall include verification that:
 - a. The air cylinder is full. Cylinders shall be refilled if the pressure is found to be below 90 % of the rated capacity (4050 psi for a 4500 psi SCBA).
 - b. The regulator, low pressure alarm, and integrated pass device function properly.
 - c. All parts are in operable condition.
 - d. The unit is clean and ready for use.

B. Cleaning and Sanitizing

1. Following the manufacturer's instructions, respirators shall be cleaned and sanitized after each use or when the need for cleaning is identified.

C. Function Testing

1. Each SCBA unit shall be thoroughly inspected and flow tested annually by a qualified technician, following the manufacturer's recommended procedures. Also, units shall be flow tested after major maintenance or repairs are conducted and before being returned to service.
2. Maintenance, inspection, and flow test records for each SCBA unit shall be maintained by the Baltimore County Fire Department Breathing Apparatus Technician with a copy annually to the Air Administrator.

D. Maintenance and Repairs

1. Maintenance and repairs shall only be performed by members who have been trained and certified by the Baltimore County Fire Department to perform such operations on the specific make and model of respirators.
2. A maintenance and inspection record for each respirator shall be maintained at the Breathing Apparatus Repair Shop.

E. Air Quality

1. Breathing air compressors, air storage systems, and refill stations shall be regularly inspected and maintained in compliance with the manufacturer's recommendation. The Air Administrator is responsible for ensuring that all such systems are properly inspected and maintained.
2. Compressed gaseous breathing air for SCBA cylinders shall meet the requirements of ANSI/CGA g-7.1, 1989, Commodity Specification for Air, with a minimum air quality of Grade D.
3. Air produced by each of the Department's compressor and refill systems shall be tested at least quarterly by an independent laboratory to ensure that it meets the required specification. The test results shall be forwarded to and maintained by the Breathing Apparatus Technician with a copy to the Air Administrator.
4. A certificate of compliance, certifying that the air has been analyzed by a reputable testing agency and complies with the required specification shall accompany air obtained from other sources. These certificates shall be maintained at the location where the air is stored, until it is expended, then forwarded to the Breathing Apparatus Technician with a copy to the Air Administrator.
5. Breathing Apparatus Technician shall maintain a record of each respirator noting the date of acquisition and assignment, annual inspections and function tests, modifications, overhaul and repairs, with a copy to the Air Administrator.
6. Breathing Apparatus Technician shall also maintain records for each breathing air refill system, including compressors, filters, air storage cylinders and refill stations. This record shall track maintenance, inspection, repairs, and modifications to the system.

Section 10: Program Evaluation

- A. The Air Administrator shall annually review the effectiveness of the Respiratory Protection Program and provide a written report to the Fire Chief. This review shall include:
 - 1. An assessment of compliance with the program requirements.
 - 2. An analysis of reports of respiratory injuries and exposures.
 - 3. A review of changes to applicable regulations and consensus standards.
 - 4. Advances in respiratory protection technology.
- B. The Air Administrator shall periodically develop and issue updates to this Respiratory Protection Program and to related procedures and practices.

Appendix C-8:
SOP 400-27B
Breathing Apparatus
and Air Units

S.O.P. #: 400-27B

SUBJECT: BREATHING APPARATUS AND AIR UNITS

DIVISION: EMERGENCY OPERATIONS

Objective: To assist members in the use, routine inspection, maintenance, hydrostatic test check and refilling of Breathing Apparatus.

Section 1: Pressure – Demand Breathing Apparatus

A. Utilization of Breathing Apparatus in Untenable Atmospheres

1. All personnel shall wear breathing apparatus when there is possible exposure to chemicals and during interior fire extinguishment/overhaul operations and when otherwise directed by the Safety Officer, in conjunction with the Incident Commander.

B. Routine In-Station Inspection

1. The officer-in-charge of each unit will ensure that all breathing apparatus is inspected at the beginning of each shift.
2. Inspection of breathing apparatus will be conducted by the member assigned to the specific riding position, utilizing Appendix 1.

C. Routine In-Station Maintenance

1. All breathing apparatus shall be cleaned after each use, every Tuesday morning during routine house duties, whether they have been used or not since the last cleaning.
2. The following procedures are to be followed when cleaning breathing apparatus as specified in Appendix 1.

a. Marking of Air Cylinders.

- 1) All cylinders and harnesses are to be marked with the unit identification number, i.e., E-17, T-15, E-281, M-4. Markings shall be clearly legible.
 - a) Cylinder marking shall be located on the gauge side of the cylinder, near the gauge.
 - b) Harness marking shall be located on the back securing plate utilizing a 2" by 2" square of the station equipment color code outlined in S.O.P. 400-09.
- 2) Information plates on the cylinders are NOT to be painted.

- 3) Carbon Fiber Cylinders are not to be painted, with the exception of the unit identification number as specified above, utilizing a 2" by 2" square of the station equipment color code as outlined in S.O.P. 400-09.
 - a) When carbon fiber cylinders become heavily soiled, they can be cleaned as outlined in Appendix 1.

Section 2: Hydrostatic Test for Air Cylinders

Refer to Air Mask Instructions manual distributed in August 1999.

Section 3: Refilling of Air Cylinders

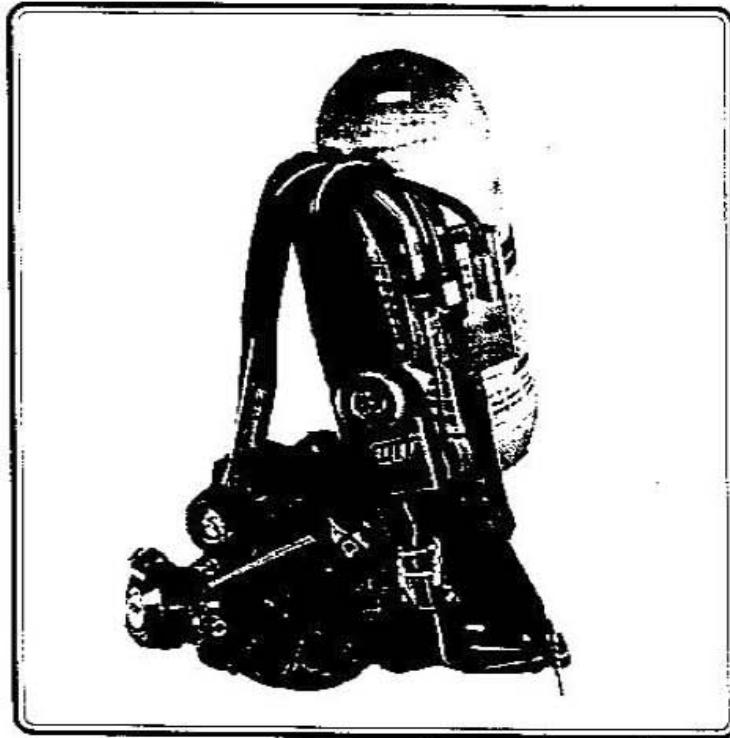
A. Air Cascade Systems are used for the refilling of breathing apparatus air cylinders.

B. Operation of the Air Cascade System

1. Determine the latest hydrostatic test date on the breathing apparatus cylinder to be refilled. Do not fill any cylinder that is beyond its hydrostatic test limit.
2. Determine the pressure of the cylinder by checking the cylinder gauge.
3. Connect the charging whip to the breathing apparatus air cylinder.
4. Choose the lowest numbered air cascade bottle which has a pressure just above that of the breathing apparatus cylinder by opening the cascade bottle valves one at a time and reading the pressure on the manifold gauge. (If all cascade bottles are topped off at 5000 P.S.I., start with bottle #1).
5. Be sure all cascade bottle valves are closed. Open both the breathing apparatus cylinder and the charging whip valves slowly and fully.
6. Compare PSI reading of air cylinder gauge and the manifold gauge. If there is more than a 200 PSI difference (using the manifold gauge as master) have that cylinder sent to Breathing Apparatus Repair to be repaired.
7. Open the cascade bottle which was determined in "4" above, slowly and allow air to slowly flow into breathing apparatus cylinder.
8. If the cascade bottle does not have sufficient pressure to fill the apparatus cylinder, shut down that cascade bottle and open the next higher numbered cascade bottle and, again, slowly allow air to flow. If that cascade bottle does not have sufficient pressure to fill the breathing apparatus cylinder, repeat the operation until approximately 4500 PSI is reached using the manifold gauge as the master gauge, then shut all valves and disconnect air cylinder from the charging whip.

APPENDIX 1

**S.C.B.A.
TRAINING**



PARTNERS FOR THE FUTURE

**BALTIMORE COUNTY
FIRE DEPARTMENT**

**SCOTT HEALTH AND SAFETY
1999**

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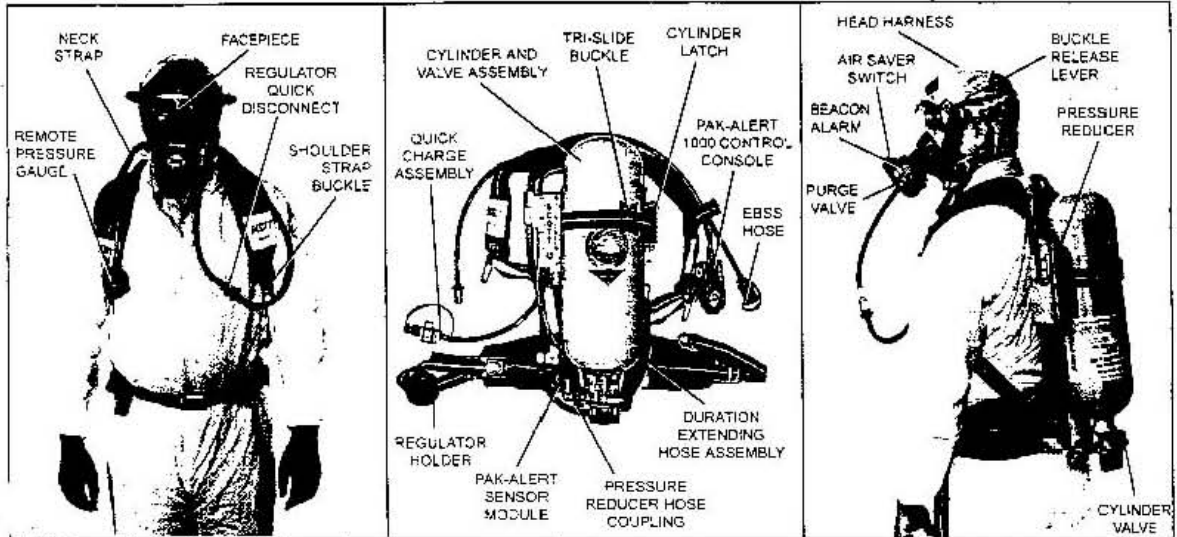
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SCOTT®

OPERATING & MAINTENANCE INSTRUCTIONS

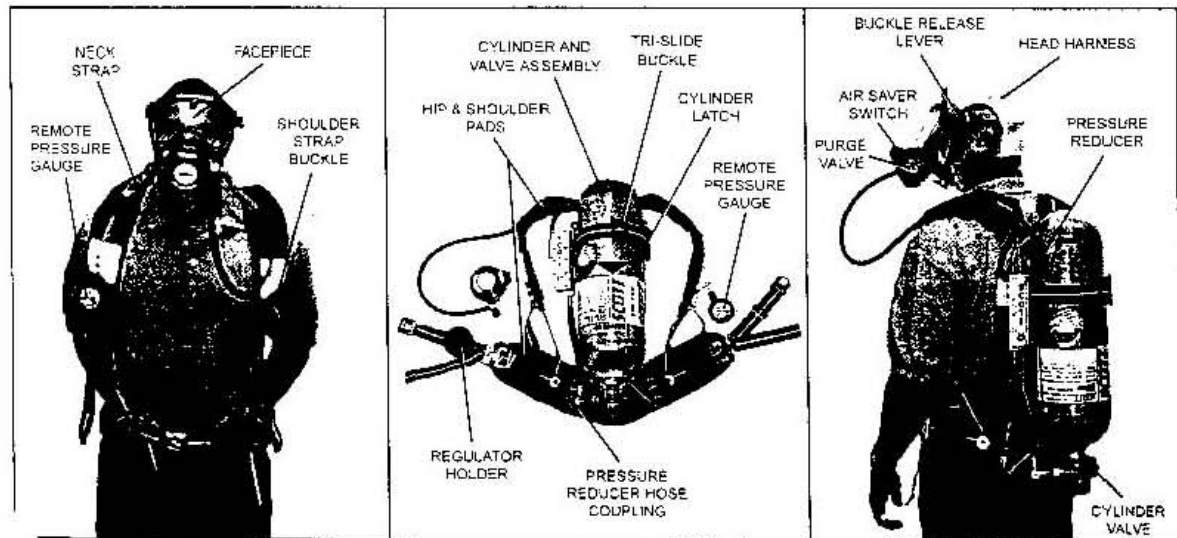
AIR-PAK® 2.2 / 3.0 / 4.5 SELF CONTAINED BREATHING APPARATUS NFPA-1981 (1997 Edition) Compliant Pressure Demand Type Regulator



TYPICAL AIR-PAK FIFTY
FRONT VIEW

TYPICAL AIR-PAK FIFTY
W/ OPTIONAL ACCESSORIES

TYPICAL AIR-PAK FIFTY
LEFT SIDE VIEW



TYPICAL WIRE FRAME AIR-PAK
FRONT VIEW

TYPICAL WIRE FRAME AIR-PAK
W/ OPTIONAL ACCESSORIES

TYPICAL WIRE FRAME AIR-PAK
LEFT SIDE VIEW

Typical Scott SCBAs shown—2.2, 3.0, and 4.5 SCBAs may vary in appearance, accessories and options.

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WARNING

IMPROPER USE OF THIS RESPIRATOR MAY RESULT IN PERSONAL INJURY OR DEATH. IMPROPER USE INCLUDES, BUT IS NOT LIMITED TO, USE WITHOUT ADEQUATE TRAINING, DISREGARD OF THE WARNINGS AND INSTRUCTIONS CONTAINED HEREIN, AND FAILURE TO INSPECT AND MAINTAIN THIS RESPIRATOR.

THIS RESPIRATOR IS INTENDED TO BE USED ONLY IN CONJUNCTION WITH AN ORGANIZED RESPIRATORY PROTECTION PROGRAM WHICH COMPLIES WITH THE REQUIREMENTS OF

"PRACTICES FOR RESPIRATORY PROTECTION," Z88.2 AVAILABLE FROM AMERICAN NATIONAL STANDARDS INSTITUTE INC., 1430 BROADWAY, NEW YORK, N.Y., 10018, OR THE REQUIREMENTS OF OSHA SAFETY AND HEALTH STANDARD 29 CFR 1910 PARAGRAPH 134 AVAILABLE FROM THE U.S. DEPARTMENT OF LABOR, OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION, OR OTHER PERTINENT NATIONALLY RECOGNIZED STANDARDS, SUCH AS THOSE PROMULGATED BY THE U.S. COAST GUARD OR THE DEPARTMENT OF DEFENSE.

INTRINSIC SAFETY

The Scott EZ Flow Regulator with Beacon Alarm, 804370-03 and 804370-04, is listed as intrinsically safe by the following:

ETL — Class I, Class II and Class III, Division 1, Groups A, B, C, D, E, F and G, per UL913, Fifth Edition.

Battery: Rayovac CR1025 3V.

Not Evaluated as an ignition source in an explosive or flammable atmosphere by MSHA/NIOSH.

GENERAL DESCRIPTION

The respirator provides the user with respiratory protection while performing work in objectionable, oxygen deficient and/or unbreathable (toxic) atmospheres. The Scott Air-Pak 2.2 SCBA is a respirator designed for use with a 2216 psi cylinder. The Scott Air-Pak 3.0 SCBA is a respirator designed for use with a 3000 psi cylinder. The Scott Air Pak 4.5 SCBA is a respirator designed for use with a 4500 psi cylinder.

This respirator is to be used **only** by persons trained in the use of the respirator and **only** in conjunction with an organized respiratory protection program. This respirator is not to be used for purposes other than authorized by your respiratory protection program. For example, this respirator must not be used underwater.

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

The Air-Pak 2.2/3.0/4.5 is supplied with one of four harness and frame assemblies. Backframe assembly 804415-series is supplied with a waist belt, shoulder straps, and waist-to-shoulder straps of black Kevlar[®] with yellow stripes; a stamped aluminum frame; and integral Kevlar shoulder and waist pads. Backframe assembly 804173-series is supplied with a steel wire frame and a waist strap assembly, shoulder straps, and side straps of yellow Kevlar.

The breathing regulator is equipped with an air saver/donning switch which can be activated to prevent rapid loss of air supply if the system is turned on prior to donning the facepiece or if the facepiece is removed while the cylinder valve is open.

¹Kevlar is a registered trademark of E. I. du Pont de Nemours, Inc.

WARNING

USE OF THIS RESPIRATOR IN ENVIRONMENTS THAT MAY EXPOSE THE USER TO TOXIC OR HAZARDOUS SUBSTANCES WHICH CAN IRRITATE OR POISON THROUGH THE SKIN SUCH AS HYDROGEN CYANIDE, OR USE IN ENVIRONMENTS THAT MAY EXPOSE THE USER TO PHYSICAL HAZARDS SUCH AS HEAT AND COLD REQUIRE THE USE OF PROTECTIVE CLOTHING IN ADDITION TO THE RESPIRATOR. CERTAIN ENVIRONMENTS SUCH AS EXTREMES OF HEAT AND COLD, THE POSSIBILITY OF FLAME CONTACT, THE PRESENCE OF CERTAIN HAZARDOUS MATERIALS, ETC, MAY REQUIRE THAT PROTECTIVE MATERIAL COVER SOME OR ALL OF THE RESPIRATOR IN ADDITION TO COVERING THE USER.

The breathing regulator is also equipped with both Vibralert® and Beacon end-of-service alarms. The Vibralert alarm vibrates to warn the user of diminishing air supply by both sound and feel. The Beacon Alarm warns the user to leave the contaminated area by flashing two red lights attached to the side of the regulator and in the user's peripheral vision.

The pressure reducing regulator uses a redundant dual path reducing system. The secondary system automatically supplies air if the primary system fails closed. When the secondary system is in operation, the Vibralert alarm and the Beacon Alarm are also actuated to warn the user that the primary system has malfunctioned.

Respirators are available with or without a quick disconnect in the hose to the mask mounted breathing regulator.

The facepiece utilized on this respirator is available in 3 color coded sizes from small to extra large. The facepiece design incorporates a nose cup, two inhalation valves and dual voicemitter assemblies that are integral parts of the approved respirator assembly. The facepiece may be readily detached from the breathing regulator to allow for utilization of the best fitting and most comfortable size facepiece for an individual user. Each size facepiece may be equipped with a lens kit if the use of corrective spectacles is required. See ACCESSORIES Section for facepiece options.

The duration of the respirator may be extended by use of a low pressure airline air supply. (For details see ACCESSORIES Section.) The respirators are National Institute for Occupational Safety and Health (NIOSH) approved for use in temperatures to 25°F below zero.

The respirator may be equipped with optional accessories such as the Pak-Aler™ 1000 Distress Alarm integrated PASS device. Identify which accessories are installed on your respirator and become familiar with their use. Refer to the Operation and Maintenance instructions for those accessories for details of regular operational inspection. (Selected options are listed in the ACCESSORIES Section).

The 2.2 SCBA is approved and maintained under NIOSH approval number TC-13F-80. The 3.0 SCBA is approved and maintained under NIOSH approval number TC-13F-366. Depending on the and cylinder and valve used, the 4.5 SCBA are approved and maintained under NIOSH approval numbers TC-13F-76 (30 minute), TC-13F-212 (45 minute) or TC-13F-96 (60 minute). These respirators meet the requirements of Title 42, Part 84 of the Code of Federal Regulations when used and maintained in accordance with these instructions and the complete NIOSH approval label, 89347-01, included with these instructions.

In addition to meeting the requirements of NIOSH, this respirator meets the requirements of the National Fire Protection Association (NFPA) 1981 Standard on Open-Circuit, Self-Contained Breathing Apparatus for Fire Fighters, 1997 Edition, when configured in accordance with the NFPA label located on the harness and backframe assembly. Due to the nature of certification under the NFPA Standard, not all sub-assemblies and/or accessories which are approved by NIOSH are certified under the NFPA Standard. Each major assembly is labeled with its Scott assembly identification part number. Each approval label lists the Scott assembly identification number of the major assemblies which comprise an approved respirator under the approval criteria. Care must be taken during maintenance and replacement of respirator components to ensure that the respirators comply with the appropriate label. To maintain NFPA certification, only use Air-Pak in accordance with NFPA 1500, *Standard on Fire Department Safety & Health Program*.

WARNING

RESPIRATORS SHALL NOT BE WORN WHEN CONDITIONS PREVENT A GOOD FACE SEAL. SUCH CONDITIONS MAY INCLUDE, BUT ARE NOT LIMITED TO, GROWTH OF BEARDS, SIDEBURNS, A SKULL CAP THAT PROJECTS UNDER THE FACEPIECE, OR TEMPLE PIECES ON GLASSES. ALSO, THE ABSENCE OF ONE OR BOTH DENTURES CAN SERIOUSLY AFFECT THE FIT OF A FACEPIECE.

WARNING

IDENTIFY THE OPTIONS INSTALLED ON YOUR RESPIRATOR AND BECOME FAMILIAR WITH THEIR USE. REFER TO THE OPERATION AND MAINTENANCE INSTRUCTIONS FOR THOSE ACCESSORIES FOR DETAILS OF REGULAR OPERATIONAL INSPECTION.

SERVICE LIFE

The Air-Pak 2.2 and Air-Pak 3.0 respirators are rated and approved by NIOSH as 30 minute duration units. The Air-Pak 4.5 respirator is rated and approved by NIOSH as a 30 minute/ 45 minute/ 60 minute duration unit when properly donned, used and maintained by trained personnel. End-of-service alarms actuate when approximately 25% of the rated service time remains. The alarms will continue to operate until the cylinder is nearly depleted.

The user should not expect to obtain exactly the rated service life from this respirator on each use. The work being performed may be more or less strenuous than that used in the NIOSH test. Where work is more strenuous, the duration may be shorter, possibly as short as one-half the rated service time. Likewise, the time remaining after either alarm actuates will be similarly reduced. As previously mentioned, the Vibralert and the Beacon Alarm will also actuate in the event of a malfunction of the primary pressure reducer.

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

1. the degree of physical activity of the user;
2. the physical condition of the user;
3. the degree to which the user's breathing is affected by excitement, fear or other emotional factors;
4. the degree of training or experience which the user has with this or similar equipment;
5. whether or not the cylinder is fully charged at the start of the work period;
6. the possible presence in the compressed air of carbon dioxide concentrations greater than .04% normally found in atmospheric air;
7. the atmospheric pressure: for example, if used in a pressurized tunnel or caisson at 2 atmospheres (15 psi gauge) the duration will be one-half as long as when used at 1 atmosphere; and at 3 atmospheres will be one-third as long;
8. loose or improperly fitting facepiece;
9. the condition of the respirator being used.

WARNING

THE INFORMATION BELOW IS MEANT TO SUPPLEMENT, NOT REPLACE, THE INSTRUCTIONS, TRAINING, SUPERVISION, MAINTENANCE, AND OTHER ELEMENTS OF YOUR ORGANIZED RESPIRATORY PROTECTION PROGRAM. SEE WARNING ON SECOND PAGE OF THIS DOCUMENT.

REGULAR OPERATIONAL INSPECTION

The following procedure shall be used when you first receive the respirator and for daily inspection of the respirator. A respirator not routinely used, but kept for emergency use, shall be inspected at least weekly. All respirators shall be inspected after each use. If any malfunction is noted, remove the respirator from service and tag for repair by authorized personnel.

If the respirator is equipped with a Pak-Alert 1000 Distress Alarm, the following procedures must be modified to include the Pak-Alert Operation and Maintenance Instructions, Scott P/N 89307-01.

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

WARNING

WHEN THE VIBRALERT OR THE BEACON ALARM ACTUATES, IT WARNS THE USER THAT APPROXIMATELY 25% OF FULL PRESSURE REMAINS IN THE AIR CYLINDER (THAT IS, APPROXIMATELY 3/4 OF THE TOTAL AIR SUPPLY HAS BEEN USED) OR THAT THERE IS A MALFUNCTION IN THE PRIMARY BREATHING CIRCUIT. IN EITHER EVENT, LEAVE THE CONTAMINATED AREA AT ONCE. IN AREAS WHERE MORE THAN ONE RESPIRATOR IS BEING USED, YOU CAN IDENTIFY YOUR OWN ALARM BY SENSING THE VIBRATIONS THROUGH YOUR FACEPIECE OR OBSERVING THE FLASHING RED LIGHTS IN YOUR PERIPHERAL VISION.

WARNING

FOLLOW THE REGULAR OPERATIONAL INSPECTION PROCEDURE EXACTLY. IF THE VIBRALERT OR BEACON ALARMS DO NOT ACTUATE, THE PURGE DOES NOT ACTUATE AS DESCRIBED OR ANY OTHER OPERATIONAL MALFUNCTION IS NOTED, DO NOT USE THE RESPIRATOR.

WARNING

REFER TO SCOTT INSTRUCTION 89307-01 WHEN RESPIRATOR IS EQUIPPED WITH PAK-ALERT 1000 DISTRESS ALARM. IF THE PAK-ALERT 1000 IS USED IN AN AREA OF EXPLOSIVE OR FLAMMABLE HAZARDS, FAILURE TO REGULARLY INSPECT AS INSTRUCTED, FAILURE TO CORRECT DAMAGE BEFORE USE OR THE INSTALLATION OF INCORRECT BATTERIES MAY LEAD TO A FIRE OR EXPLOSION WHICH MAY RESULT IN PERSONAL INJURY OR DEATH.

2. Check the latest cylinder hydrostatic test date to ensure it is current, i.e., within 3 years for composite fiber overwrapped cylinders and 5 years for aluminum cylinders. If you have any questions about the condition of a cylinder, consult your organized respiratory protection program. It is the responsibility of your organized respiratory protection program to maintain visual inspection and hydrostatic testing of cylinders.
3. Visually inspect cylinder for dents or gouges in metal or in composite wrapping. Cylinders which show damage or exposure to high heat or flame, such as paint turned brown or black, decals charred or missing, gauge lens melted or elastomeric bumper distorted, shall be removed from service and emptied of compressed air. Refer to current applicable publications on compressed gas cylinder inspection available from Compressed Gas Association Inc. (703-413-4341), 1725 Jefferson Davis Hwy., #1004, Arlington, VA 22202.
4. Check cylinder pressure gauge for "FULL" indication. If cylinder pressure is less than "FULL," replace with a fully charged cylinder.
5. Check to ensure reducer hose coupling is hand tightened to the cylinder valve outlet.
6. Check that the breathing regulator purge valve (red knob on regulator) is closed (full clockwise and pointer on knob upward).
7. If the hose to the breathing regulator is equipped with a quick disconnect (See STANDBY INSPECTION, CLEANING AND STORAGE Section for instruction on operation of the quick disconnect coupling on regulator assemblies), check that the quick disconnect is engaged properly and that sleeve "C" is rotated 1/4 to 1/2 turn so notch "B" does not line up with rivet head "A". Test for proper engagement by tugging on the coupling. See Figure 1.

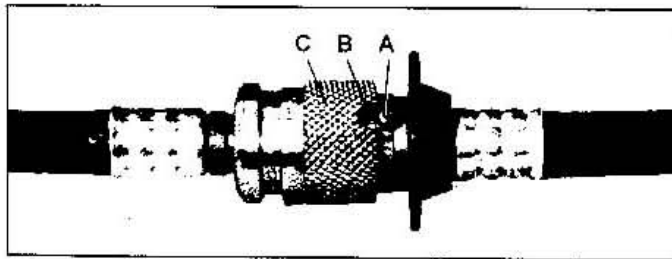


FIGURE 1

8. Fully depress the center of the air saver/donning switch on the top of the regulator and release.
9. Slowly open the cylinder valve by fully rotating knob counterclockwise. Vibralert alarm shall actuate and then stop. The Beacon Alarm (see Figure 2) will begin to flash and then stop. If the Beacon Alarm continues flashing, the air trapped in the regulator hose/line will have to be bled down. This can be done either by opening and then closing the purge valve, or by breathing down the air as described in step 10. There shall be no air flow from the facepiece.

WARNING

CYLINDERS WHICH EXHIBIT THESE CONDITIONS MAY SUDDENLY LEAK OR RUPTURE IF CHARGED WITH COMPRESSED AIR.

CAUTION

WRENCHES SHALL NOT BE USED, AS DAMAGE, PARTICULARLY TO THE COUPLING GASKET, MAY RESULT.

CAUTION

DO NOT USE TOOLS TO OPEN OR CLOSE THE PURGE VALVE. OPEN OR CLOSE BY USING FINGER-PRESSURE ONLY. ROTATION OF THE PURGE VALVE IS LIMITED TO 1/2 TURN.

WARNING

FAILURE TO ENSURE THAT THE SLEEVE IS ROTATED AFTER THE "CLICK" AND/OR FAILURE TO CHECK ENGAGEMENT OF THE COUPLING AS DESCRIBED MAY LEAD TO HOSE SEPARATION AND LOSS OF BREATHING AIR.



FIGURE 2

10. Don the facepiece or hold the facepiece to the face to effect a good seal. Inhale sharply to automatically start the flow of air. Breathe normally from the facepiece to ensure proper operation. If the Beacon Alarm had continued flashing in Step 9, it shall now stop flashing.
11. Remove facepiece from face. Air shall freely flow from the facepiece.
12. Fully depress the center of the air saver/donning switch on the top of regulator and release. The flow of air from the facepiece shall stop.
13. Rotate purge valve 1/2 turn counterclockwise (pointer on knob downward). Air shall freely flow from the regulator.
 Rotate purge valve 1/2 turn clockwise to full closed position (pointer on knob upward). Air flow from regulator shall stop.
15. Push in and rotate cylinder valve knob clockwise to close. When cylinder valve is fully closed, open purge valve slightly to vent residual air pressure from system. The Vibralert and Beacon Alarms shall actuate as the pressure drops and then both shall stop. When air flow stops completely, return purge valve to the fully closed position (pointer on knob upward).

WARNING

IF THE BEACON ALARM FAILS TO ACTUATE OR DOES NOT STOP FLASHING AFTER BLEEDING THE AIR FROM THE LINE WITH THE PURGE VALVE AND THE AIR FLOW HAS STOPPED COMPLETELY, DO NOT USE THE RESPIRATOR. REMOVE IT FROM SERVICE AND TAG FOR REPAIR BY AUTHORIZED PERSONNEL.

PREPARATION FOR USE

1. If carrying case is used for storage, proceed as follows:
 Place carrying case on ground or level surface, open lid (hard case) or top flap (soft case). Check cylinder gauge for "FULL" indication. If not full, replace cylinder before use. A gauge indication of other than full may indicate an air leak in the cylinder and valve assembly or a malfunction of the gauge assembly. Ensure that the cylinder is firmly locked in position by the cylinder retention assembly. Stand at the top of the cylinder end, lean forward, position and spread out the shoulder straps, and grasp the backframe with both hands, one on each side of the cylinder. Do not grasp the pressure reducer. Swing the respirator straight up and over the head keeping elbows close to body. Rest the respirator on your back while slightly bent over. Ensure that the shoulder straps slide along your arms and fall into place on the shoulders. Straighten up as you pull down on the side straps to adjust the harness to fit your body.

NOTE

The SCBA is approved only with NIOSH/NFPA accessories. Accessories not certified for use with this SCBA or other items attached to the SCBA may degrade the performance of this SCBA or may void NIOSH/NFPA certification.

NOTE

Ensure that facepiece seal is maintainable with all protective equipment such as fire helmet and turnout gear. Reference NFPA 1500, *Standard on Fire Department Safety & Health Program*, and ANSI Z88.2-1992, *Practices for Respiratory Protection*. Do not attach anything to Air-Pak shoulder strap buckle as this can cause the shoulder straps to loosen.

If storage bracket is used, proceed as follows:
Check the cylinder gauge for "FULL" indication. If not full, replace cylinder before use. A gauge indication of other than full may indicate an air leak in the cylinder and valve assembly or a malfunction of the gauge assembly. Ensure that the cylinder is firmly locked in position by the cylinder retention assembly. Follow the instructions of the bracket manufacturer for placing arms through shoulder straps and freeing the respirator from the bracket.

2. Connect the waist belt buckle and adjust by pulling forward on the two (2) side-mounted belt ends.
3. Readjust shoulder straps to ensure the weight is carried on the hips.
4. The regulator is retained by the facepiece with a 1/4 turn port and is locked in the facepiece retainer with a lock tab. If the regulator is not attached to the facepiece, be sure the gasket is in place around the outlet port of the regulator and not damaged. With the red purge valve in the 12 o'clock position, align the two flats of the outlet port with corresponding flats in the facepiece port and insert. Rotate the regulator counterclockwise (viewed from inside of facepiece) so that the red purge valve knob is situated on the left side of the facepiece. The lock tab on the mask-mounted regulator will lock into the facepiece retainer with a "click". If properly engaged, the regulator will not rotate.
5. Fully depress center of the air saver/donning switch on top of regulator and release.
6. Slowly open cylinder valve fully. The user will both hear and feel the Vibralert alarm in the facepiece start and stop. The Beacon Alarm will begin flashing and stop. There will be no free flow of air from the facepiece at this time. The Beacon Alarm may continue flashing until the air trapped in the regulator hose/line has been bled down. This can be done either by opening and then closing the purge valve, or by placing the facepiece to the face to effect a good seal and inhaling sharply to automatically start the air flow. Remove the facepiece from face. Air shall flow freely from the facepiece. Fully depress the center of the air saver/donning switch on the top of the regulator and release. The flow of air from the facepiece shall stop.

WARNING

THE CYLINDER VALVE MUST BE FULLY OPENED FOR PROPER OPERATION OF THE RESPIRATOR.

WARNING

IF THE VIBRALERT ALARM FAILS TO ACTUATE OR DOES NOT STOP AFTER A BRIEF INTERVAL, DO NOT USE THE RESPIRATOR. REMOVE IT FROM SERVICE AND TAG FOR REPAIR BY AUTHORIZED PERSONNEL.

WARNING

IF THE BEACON ALARM FAILS TO ACTUATE OR DOES NOT STOP FLASHING AFTER BLEEDING THE AIR FROM THE LINE WITH THE PURGE VALVE AND THE AIR FLOW HAS STOPPED COMPLETELY, DO NOT USE THE RESPIRATOR. REMOVE IT FROM SERVICE AND TAG FOR REPAIR BY AUTHORIZED PERSONNEL.

If the respirator is equipped with a Pak-Alert 1000 Distress Alarm, the alarm will sound 3 quick audible chirps and a green flashing light will be observed on the Pak-Alert control console. Refer to the Pak-Alert Operating and Maintenance Instructions, P/N 89307-01, for further information on the Pak-Alert operation and prior to using respirator.

NOTE

If the air saver/donning switch has not been depressed prior to opening the cylinder valve, the Vibralert alarm will not actuate due to the air flowing freely from the facepiece.

The user is now in "stand-by" condition. The respirator is in place, but not in use.

The regulator is retained by the facepiece with a 1/4 turn port and is locked in the facepiece retainer with a lock tab. To detach the regulator from the facepiece while in "stand-by" condition, place your right hand over the cover with your thumb on the lock tab. Pull the lock tab toward the cover and rotate the regulator 1/4 turn clockwise (viewed from inside of facepiece). When the red purge valve is in the 12 o'clock position remove regulator from the facepiece. An optional regulator holder which attaches to the user's belt and a facepiece neck strap are available for use during "standby" condition. (For details see ACCESSORIES Section.)

USE OF RESPIRATOR

If respirator use is expected at temperatures near or below freezing, or if respirator is to be used after being kept at temperatures near or below freezing, refer to LOW TEMPERATURE OPERATION Section for additional information and supplemental procedures.

If regulator is not attached to facepiece, be sure the regulator gasket is in place around the outlet port of the regulator and not damaged. With the red purge valve in the 12 o'clock position, align the two flats of the outlet port with corresponding flats in the facepiece port and insert. Rotate the regulator counterclockwise (viewed from inside of facepiece) so that the red purge valve knob is situated on the left side of the facepiece. The lock tab on the mask-mounted regulator will lock into the facepiece retainer with a "click." If properly engaged, the regulator will not rotate.

To begin use of respirator, don the facepiece (i.e., place facepiece on face and obtain a proper seal) as follows:

1. Examine the facepiece assembly to be certain the nose cup inhalation valves are installed, the nose cup is correctly positioned inside the faceseal chin cup, and nose cup is properly seated between the flanges of the voicemitter ducts.
2. Adjust the head straps to the full outward position.
3. Hold the head harness out of the way with one hand while placing the facepiece on the face with the other hand. **Note:** Ensure that the chin is properly located in the chin pocket of the facepiece.
4. Pull the head harness over the head and ensure that straps are lying flat against the head and neck with no twists.
5. Tighten the neck straps by pulling the two lower strap ends toward the rear of the head.

WARNING

IF THE RESPIRATOR IS EQUIPPED WITH A PAK-ALERT 1000 DISTRESS ALARM AND THE PAK-ALERT FAILS TO FUNCTION IN ACCORDANCE WITH SCOTT INSTRUCTION 89307-01, DO NOT USE THE RESPIRATOR. REMOVE IT FROM SERVICE AND TAG FOR REPAIR BY AUTHORIZED PERSONNEL.

6. Stroke the head harness down the back of the head using one or both hands. Retighten neck strap.
7. Adjust the temple straps by pulling the two upper strap ends toward the rear of the head. Use caution pulling temple straps as overtightening may cause discomfort.
8. Retighten the neck straps if required. Note, on subsequent use by the same wearer, release and retightening of the temple straps may not be required.
9. With facepiece sealed to face, inhale sharply to actuate respirator. Air will then be supplied during inhalation.

NOTE

If air is not supplied on first inhalation, check that cylinder valve is open, remote gauge indicates pressure in cylinder, and facepiece is sealed to face.

10. Close cylinder valve by simultaneously pushing in on cylinder valve knob and rotating it clockwise. Breathe on respirator until air flow stops. Vibralert and Beacon Alarms will actuate, then stop. Inhale slowly and hold your breath momentarily. No leakage of air shall be detected and the facepiece shall be drawn slightly to the face. Open cylinder valve fully and breathe normally.

If the environment is suitably quiet, leakage from the facepiece can also be detected by listening for a flow of air while holding your breath. Inhale and hold your breath momentarily after donning the facepiece. Do not depress air saver/donning switch. Air should not be heard flowing into the facepiece from the regulator and no flow of air shall be detected outward from the facepiece.

If leakage of air is detected during either of the above procedures, depress the air saver/donning switch on the top of the regulator, doff the facepiece and repeat donning steps 1 through 8 above. If leakage persists, do not use the respirator.

11. Proceed with use of respirator in accordance with your respiratory protection program.

EVERY ENTRY INTO A CONTAMINATED OR UNKNOWN ATMOSPHERE SHOULD BE PLANNED TO ENSURE THAT THERE IS SUFFICIENT AIR SUPPLY TO ENTER, CARRY OUT THE TASKS REQUIRED AND RETURN TO A SAFE BREATHING AREA. THE USER SHOULD CHECK THE REMOTE READING PRESSURE GAUGE ON THE SHOULDER STRAP PERIODICALLY TO DETERMINE THE RATE OF AIR CONSUMPTION. IN ANY EVENT, THE USER MUST BE CERTAIN TO ALLOW SUFFICIENT AIR FOR EGRESS FROM THE CONTAMINATED AREA. IF ENTRY IS ATTEMPTED AFTER THE AIR HAS BEEN PARTIALLY CONSUMED (CYLINDER LESS THAN FULL), THE USER MUST BE CERTAIN THAT THE REMAINING AIR WILL BE SUFFICIENT FOR SAFETY.

Leave the contaminated or unknown atmosphere immediately if the Vibralert alarm or the Beacon Alarm actuates, and, in a safe area, determine cause of alarm. When air supply has been depleted, replace cylinder following CYLINDER REPLACEMENT PROCEDURE.

WARNING

DO NOT USE RESPIRATOR IF LEAKAGE OF AIR INTO THE FACEPIECE IS DETECTED. REPEAT DONNING PROCEDURE. IN THE EVENT THE FACEPIECE CANNOT BE ADJUSTED TO ELIMINATE THESE CONDITIONS, A DIFFERENT SIZE FACEPIECE MAY BE REQUIRED TO OBTAIN PROPER FACIAL FIT.

WARNING

IF AIR LEAKAGE PAST THE FACEPIECE SEAL CANNOT BE ELIMINATED BY REPEATING THE DONNING PROCEDURE, DO NOT USE THE RESPIRATOR.

WARNING

ENTRY INTO HAZARDOUS, POTENTIALLY HAZARDOUS, OR UNKNOWN CONDITIONS IS TO BE MADE USING A FULL CYLINDER WHENEVER POSSIBLE.

WARNING

WHEN THE VIBRALERT OR BEACON ALARM ACTUATES IT WARNS THE USER THAT APPROXIMATELY 25% OF THE FULL PRESSURE REMAINS IN THE CYLINDER (THAT IS, APPROXIMATELY 3/4 OF THE TOTAL AIR SUPPLY HAS BEEN USED), OR THAT THERE IS A MALFUNCTION IN THE PRIMARY BREATHING CIRCUIT. IN EITHER EVENT, LEAVE THE CONTAMINATED AREA AT ONCE. IN AREAS WHERE MORE THAN ONE RESPIRATOR IS BEING USED, YOU CAN IDENTIFY YOUR OWN ALARM BY SENSING THE VIBRATIONS THROUGH YOUR FACEPIECE.

TERMINATION OF USE

To doff the facepiece (i.e., remove the facepiece and terminate respiratory protection), proceed as follows:

1. Leave contaminated area or be certain that respiratory protection is no longer required.
2. Loosen the neck straps by simultaneously lifting the lower buckle release levers outward (away from the head) and lifting facepiece away from face. The buckle release levers are the "U-shaped" extensions of the facepiece buckle assemblies.

(NOTE: The user may find it more comfortable to first relieve tension on the upper strap by lifting the upper buckle release levers.)

3. To stop the flow of air from the facepiece, fully depress the air saver/donning switch on top of the regulator and release.

NOTE

Operation of the air saver/donning switch is intended to prevent a free flow of air and the depletion of the air supply when the facepiece is doffed. With the air saver/donning switch activated, the purge valve and Vibralert will function normally. If the purge valve has been adjusted to produce a flow, or if the Vibralert is in operation, the air will continue to be depleted.

4. Remove the facepiece by pulling it up and over the head.

NOTE

If the respirator is not going to be used for a period of time, close the cylinder valve. Leaving the air saver/donning switch activated and the cylinder valve open for an extended period of time, may result in intermittent activation of the VIBRALERT even when more than 25% of the air supply remains.

5. To resume use of the respirator, repeat the facepiece donning procedure (see USE OF RESPIRATOR Section).
6. When respirator operations are completed and only when in a safe breathing area, check that the cylinder valve is closed, and vent the residual air from the respirator by opening the purge valve. After waiting until the air flow stops, close the purge valve. Loosen shoulder straps by lifting ends of shoulder strap slide buckles up, release waist belt by pressing release button in center of waist belt buckle, and remove the unit from your back. Proceed in accordance with the requirements of your respiratory protection program for service of the respirator. The respiratory protection program should include procedures for replacement of the cylinder with a fully charged cylinder (see CYLINDER REPLACEMENT Section) and for carrying out the instructions in STANDBY INSPECTION, CLEANING AND STORAGE section for respirator and accessories.

CAUTION

FAILURE TO RELEASE TENSION ON NECK STRAPS BEFORE REMOVING FACEPIECE MAY CAUSE PREMATURE WEAR OR DAMAGE TO STRAPS AND/OR FACEPIECE ASSEMBLY.

WARNING

IF AIR FLOW FROM THE REGULATOR CANNOT BE STOPPED BY DEPRESSING THE AIR SAVER SWITCH, IMMEDIATELY CLOSE THE CYLINDER VALVE TO PREVENT DEPLETION OF THE AIR REMAINING IN THE CYLINDER.

CAUTION

AN IMPACT TO THE REGULATOR WHILE THE CYLINDER VALVE IS OPEN AND THE AIR SAVER SWITCH IS ACTIVATED MAY CAUSE AIR TO FLOW FROM THE REGULATOR AND DEplete THE AIR REMAINING IN THE CYLINDER.

WARNING

IF RESPIRATOR USE IS RESUMED AFTER THE AIR HAS BEEN PARTIALLY CONSUMED (CYLINDER LESS THAN FULL), YOU MUST BE CERTAIN THAT THE REMAINING AIR WILL BE SUFFICIENT FOR YOUR SAFETY. (SEE STEP 11 IN USE OF RESPIRATOR SECTION.)

WARNING

THE FLOW OF AIR MAY NOT START AUTOMATICALLY WHEN YOU INHALE IF THE FACEPIECE IS NOT PROPERLY DONNED AND SEALED TO THE FACE. RE-DON FACEPIECE (SEE USE OF RESPIRATOR SECTION) OR OPEN PURGE VALVE (SEE EMERGENCY OPERATION SECTION).

CAUTION

DO NOT LEAVE CYLINDER VALVE OPEN WHEN RESPIRATOR IS NOT IN USE.

CAUTION

FAILURE TO RELEASE TENSION ON SHOULDER STRAPS BEFORE REMOVING RESPIRATOR MAY CAUSE PREMATURE WEAR OR DAMAGE TO STRAPS AND/OR RESPIRATOR ASSEMBLY.

WARNING

DO NOT ALLOW RESPIRATOR TO DROP FROM BODY WHEN REMOVING. DROPPING OF RESPIRATOR MAY CAUSE DAMAGE TO RESPIRATOR THAT MAY RESULT IN INJURY OR DEATH.

EMERGENCY OPERATION

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

1. Should either the Vibralert or Beacon Alarm actuate during use, and before the air supply is depleted to approximately 25% of full capacity, the primary reducer may have failed and the system automatically transferred to the backup reducer. LEAVE THE CONTAMINATED AREA AT ONCE ON ACTUATION OF VIBRALERT OR BEACON ALARM.
2. Should the air supply be partially or completely cut off during use or if you are unable to start the flow of air automatically, fully open the purge valve (red knob on regulator) by turning it counterclockwise, (pointer on knob downward). LEAVE THE CONTAMINATED AREA AT ONCE AFTER OPENING THE PURGE VALVE.
3. Should the air supply begin to flow freely into facepiece, fully open the purge valve (red knob on regulator) by turning it counterclockwise (pointer on knob downward), partially close the cylinder valve by pushing in and rotating clockwise to regulate the flow of air to satisfy the requirements of the user. Do not close the cylinder valve completely. LEAVE THE CONTAMINATED AREA AT ONCE AFTER PARTIALLY CLOSING CYLINDER VALVE.
4. In the unlikely event of the blockage of air flow or sudden and complete loss of the system air supply such that there is total irreversible loss of respiratory protection, LEAVE THE CONTAMINATED AREA AT ONCE USING ALL PRECAUTION AND FOLLOW EMERGENCY PROCEDURES PRESCRIBED BY USER ESTABLISHED RESPIRATORY PROTECTION PROGRAM.

If the above procedures are implemented during use, REMOVE THE RESPIRATOR IN A SAFE AREA, tag the respirator and hold it for service and repair by Authorized Personnel.

LOW TEMPERATURE OPERATION

Respirators intended for routine use and respirators not routinely used but kept for emergency use shall be located in areas where the temperature is maintained above freezing (32°F).

If a respirator may be unavoidably kept at a temperature below freezing before the next use, special care **MUST** be exercised to be certain that all components of the respirator are **THOROUGHLY DRIED** after cleaning and before storage.

If a respirator has been unavoidably kept at a temperature below freezing and it is not possible to bring it to room temperature before it is to be used, do not exhale into the facepiece until the facepiece is completely donned and the nose cup is properly in place against the face.

If, after using the respirator, the facepiece is doffed in a safe breathing area which is at temperatures near or below freezing, place the facepiece with regulator connected under outerwear to keep it warm next to the body in case respirator reuse is required.

Whenever the respirator is in place but not in use ("STAND-BY" CONDITION) in areas at or below freezing, the facepiece and regulator **MUST** be protected against exposure to water.

WARNING

THESE EMERGENCY OPERATION PROCEDURES ARE FOR EMERGENCY USE ONLY AND ARE MEANT TO SUPPLEMENT, NOT REPLACE, THE EMERGENCY PROCEDURES PRESCRIBED BY YOUR RESPIRATORY PROTECTION PROGRAM. IF THEIR USE IS REQUIRED, LEAVE THE CONTAMINATED AREA AT ONCE. USE OF THESE PROCEDURES WILL INCREASE THE RATE OF CONSUMPTION OF THE AIR SUPPLY AND MAY CAUSE THE INTENSITY OF THE VIBRALERT ALARM OR THE OPTIONAL BELL ALARM TO BE DIMINISHED OR MAY CAUSE THE VIBRALERT ALARM, THE BEACON ALARM, OR THE OPTIONAL BELL ALARM TO STOP COMPLETELY.

WARNING

THE CYLINDER VALVE MUST BE FULLY OPENED FOR PROPER OPERATION OF THE RESPIRATOR.

WARNING

THE AIR FLOW THROUGH THE RESPIRATOR WHEN THE PURGE VALVE IS IN USE CAN EXCEED 200 LITERS PER MINUTE. TO REDUCE AIR CONSUMPTION, THE AIR FLOW MAY BE REDUCED BY PARTIALLY CLOSING THE PURGE VALVE.

WARNING

EMERGENCY PROCEDURE #3 IS THE ONLY TIME THE RESPIRATOR MAY BE OPERATED WITH THE CYLINDER VALVE LESS THAN FULLY OPENED.

WARNING

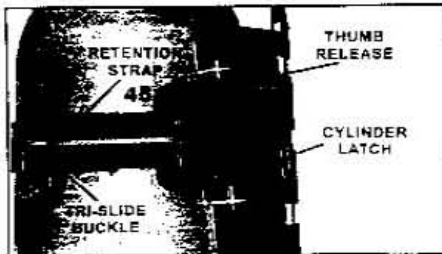
USE OF THIS RESPIRATOR AT TEMPERATURES AT OR BELOW FREEZING (32°F) WITHOUT FOLLOWING THE LOW TEMPERATURE OPERATION INSTRUCTIONS MAY RESULT IN OBSCURED VISION AND/OR PARTIAL OR COMPLETE BLOCKAGE OF THE AIR FLOW. IF THIS SHOULD OCCUR, THE AIR SUPPLY MAY BE PARTIALLY OR COMPLETELY CUT OFF AND THE EMERGENCY OPERATION PROCEDURE MAY NOT BE ABLE TO RESTART THE AIR FLOW.

WARNING

USE OF THIS RESPIRATOR AT TEMPERATURES AT OR BELOW FREEZING (32°F) WITH THE NOSE CUP OR NOSE CUP INHALATION VALVES DAMAGED OR MISSING MAY RESULT IN THE FORMULATION OF VISION IMPAIRING MIST OR ICE ON THE FACEPIECE VISION AREA WHICH CAN CREATE A DANGEROUS OR LIFE THREATENING CONDITION DURING USE.

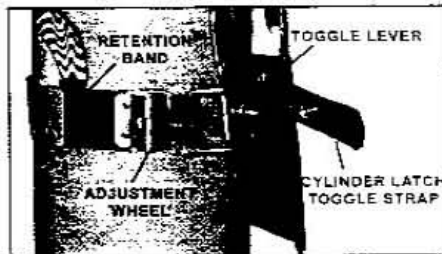
CYLINDER REPLACEMENT PROCEDURE

Three cylinder retention systems are available. Only one of these three procedures applies to your respirator. For correct instructions for cylinder replacement, match your retention system with the photos and follow the procedure listed for that photo.



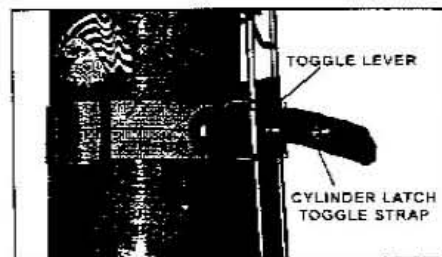
Air-Pak 50 (P/N 804415-01) &
Wire Frame Standard (P/N 804173-01)

See Procedure A



Wire Frame with Metal Band
(P/N 804173-02)

See Procedure B



Wire Frame with Strap &
Metal Toggle (P/N 804173-03)

See Procedure C

PROCEDURE A

1. Leave the contaminated area and be certain that respiratory protection is not required.
2. Do off the facepiece. (See TERMINATION OF USE Section.)
3. Push in and rotate the cylinder valve knob clockwise to close cylinder valve.
4. Bleed down residual air pressure by opening the purge valve slightly. When flow of air from facepiece stops, close purge valve fully. Remove respirator or have an assistant perform the following steps.
5. Unthread the pressure reducer hose coupling from the cylinder valve by rotating counterclockwise.
6. Disengage the cylinder latch by pressing on the thumb release while lifting on the end of the latch.

7. Grasp the cylinder below the retention strap, push the locking tab below the valve, then lift the cylinder free from the bottom hook and remove.
8. Replace with a fully charged cylinder and valve assembly of the same pressure rating. Slide the top of the cylinder upward under the strap. Engage the cylinder hanger in the hook at the bottom of the backframe. See Figures 4 and 5.



FIGURE 4

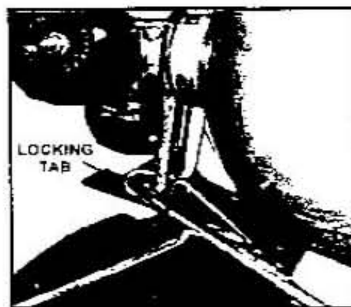


FIGURE 5

9. If a different duration cylinder is used, use the tri-slide buckle to adjust the retention strap so that it presses tightly against the cylinder when the latch assembly is fully engaged. The user should not be able to move retention strap up and down on the cylinder with their fingers when the latch assembly is fully closed.
10. Secure the cylinder in place by pushing the latch toward the backframe to lock the cylinder latch and fully engage the cylinder latch assembly.

NOTE

Ensure that the cylinder is securely held in place on the backframe by the cylinder retention assembly. Do not use excessive force to lock the latch mechanism. If the retention strap is too tight or too loose, use the tri-slide buckle to adjust the retention strap engagement length, then re-attempt to engage the latch assembly.

12. Align and tighten the hose coupling to the cylinder valve.
12. The respirator is ready for reuse.
13. The removed cylinder shall be refilled and inspected by authorized personnel. See Scott Field Level Maintenance Training Manual, available on request from Scott Health and Safety, for further information.

PROCEDURE B

1. Leave the contaminated area and be certain that respiratory protection is not required.
2. Do off the facepiece. (See TERMINATION OF USE Section.)
3. Push in and rotate the cylinder valve knob clockwise to close cylinder valve.

CAUTION

THE HOSE COUPLING IS DESIGNED TO ALLOW ONLY CYLINDERS OF THE SAME PRESSURE RATING AS THE PRESSURE REDUCER TO BE USED. FAILURE TO REPLACE CYLINDER WITH THE SAME PRESSURE RATED CYLINDER WILL DEplete AIR.

CAUTION

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

CAUTION

DO NOT LEAVE THE CYLINDER VALVE OPEN ON THE "EMPTY" CYLINDER.

4. Bleed down residual air pressure by opening the purge valve slightly. When flow of air from facepiece stops, close purge valve fully. Remove respirator or have an assistant perform the following steps.
5. Unthread the pressure reducer hose coupling from the cylinder valve by rotating counterclockwise.
6. Unsnap the cylinder latch toggle strap and release the toggle lever by pulling upward on, and then releasing, the strap.
7. Grasp the cylinder below the band, push the locking tab below the valve, lift the cylinder free from the bottom hook and remove.
8. Replace with a fully charged cylinder and valve assembly of the same pressure rating. Slide the top of the cylinder upward under the band. Engage the cylinder hanger in the hook at the bottom of the backframe. See Figure 6.

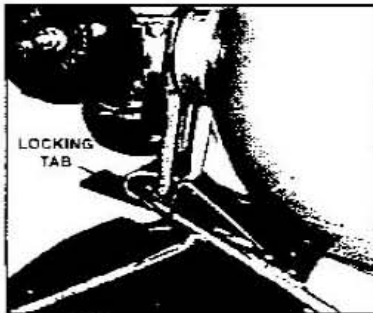


FIGURE 6

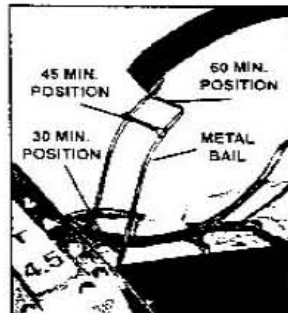


FIGURE 7

9. If a different duration rated cylinder is used, it is necessary to attach the cylinder band to a different position on the wire bail as shown in Figure 7.
10. While holding the band, push the toggle lever to secure cylinder, then lock the toggle lever by attaching the cylinder latch toggle strap to the snap on the toggle lever.

NOTE

Ensure that the cylinder is securely held in place on the backframe by the band assembly. Do not force the toggle lever to lock. If the band is too tight or too loose, use the adjustment wheel to adjust the band assembly engagement length, then lengthen the band using the adjustment wheel and then re-attempt to lock the toggle lever. The toggle lever must be in the open position to use the adjustment wheel. When properly latched, you should not be able to turn the adjustment wheel using finger pressure.

11. Align and tighten the hose coupling to the cylinder valve.
12. The respirator is ready for reuse.
13. The removed cylinder shall be refilled and inspected by authorized personnel. See Scott Field Level Maintenance Training Manual, available on request from Scott Health and Safety, for further information.

CAUTION

THE HOSE COUPLING IS DESIGNED TO ALLOW ONLY CYLINDERS OF THE SAME PRESSURE RATING AS THE PRESSURE REDUCER TO BE USED. FAILURE TO REPLACE CYLINDER WITH THE SAME PRESSURE RATED CYLINDER WILL DEplete AIR.

CAUTION

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

CAUTION

DO NOT LEAVE THE CYLINDER VALVE OPEN ON THE "EMPTY" CYLINDER.

PROCEDURE C

1. Leave the contaminated area and be certain that respiratory protection is not required.
2. Doff the facepiece. (See TERMINATION OF USE Section.)
3. Push in and rotate the cylinder valve knob clockwise to close cylinder valve.
4. Bleed down residual air pressure by opening the purge valve slightly. When flow of air from facepiece stops, close purge valve fully. Remove respirator or have an assistant perform the following steps.
5. Unthread the pressure reducer hose coupling from the cylinder valve by rotating counterclockwise.
6. Unsnap the cylinder latch toggle strap and release the toggle lever by pulling upward on, and then releasing the strap.
7. Grasp the cylinder below the retention strap, push the locking tab below the valve, lift the cylinder free from the bottom hook and remove.
8. Replace with a fully charged cylinder of the same pressure rating and valve assembly. Slide the top of the cylinder upward under the retention strap. Engage the cylinder hanger in the hook at the bottom of the backframe. See Figure 8.

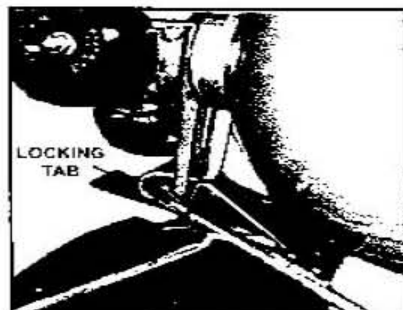


FIGURE 8

9. If a different duration cylinder is used, use the tri-slide buckle to adjust the retention strap so that it presses tightly against the cylinder when the latch assembly is fully engaged. The user should not be able to move retention strap up and down on the cylinder with their fingers when the latch assembly is fully closed.
10. Secure the cylinder in place by pushing the toggle lever toward the backframe, then lock the toggle lever by attaching the cylinder latch toggle strap to the snap on the toggle lever.

NOTE

Do not force the toggle lever to lock. If the retention strap is too tight, use the tri-slide buckle to increase the retention strap engagement length, then re-attempt to engage the latch assembly.

11. Ensure that the cylinder is securely held in place on the backframe by the cylinder retention assembly. If the retention

CAUTION

THE HOSE COUPLING IS DESIGNED TO ALLOW ONLY CYLINDERS OF THE SAME PRESSURE RATING AS THE PRESSURE REDUCER TO BE USED. FAILURE TO REPLACE CYLINDER WITH THE SAME PRESSURE RATED CYLINDER WILL DEplete AIR.

strap is too loose, disengage the toggle lever, decrease the retention strap engagement length using the tri-slide buckle and engage the latch assembly again.

12. Align and tighten the hose coupling to the cylinder valve.
13. The respirator is ready for reuse.
14. The removed cylinder shall be refilled and inspected by authorized personnel. See Scott Field Level Maintenance Training Manual, available on request from Scott Health and Safety, for further information.

STAND-BY INSPECTION, CLEANING AND STORAGE

1. Clean the respirator after each use as follows:
 - a. Inspect the equipment for worn or aging rubber parts, worn or frayed harness webbing or damaged components.
 - b. Remove the breathing regulator from the facepiece. To remove the mask-mounted regulator, place your right hand over the cover with your thumb on the lock tab. Pull the lock tab toward the cover and rotate the regulator 1/4 turn clockwise (viewed from inside of facepiece). When the red purge valve is in the 12 o'clock position, remove regulator from the facepiece.

NOTE

If the breathing regulator is equipped with a quick disconnect, the regulator may be separated from the respirator as follows:

- i) Rotate sleeve "C" until notch "B" lines up with rivet head "A" on the socket (Figure 9).
- ii) Slide sleeve "C" back toward the plastic guard and plug "D" will separate (Figure 9).

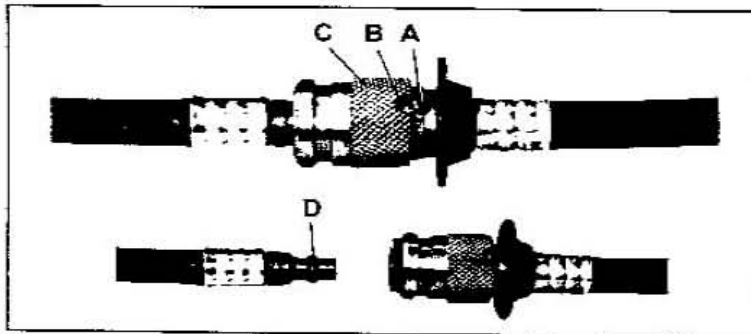


FIGURE 9

NOTE

The nose cup is designed to be an integral part of the facepiece and does not need to be disassembled for cleaning and disinfecting. In the event that the nose cup is removed for inspection, make certain it is reassembled behind the chin pocket of facepiece as shown in Figure 10, and the nose cup is properly seated between the flanges of the voicemitter ducts as shown in Figure 11.

CAUTION
DO NOT LEAVE THE CYLINDER VALVE OPEN WHEN THE RESPIRATOR IS NOT IN USE.

CAUTION
DO NOT LEAVE THE CYLINDER VALVE OPEN ON THE "EMPTY" CYLINDER.

WARNING
RESPIRATORS WITH DAMAGED OR WORN COMPONENTS SHALL NOT BE USED.

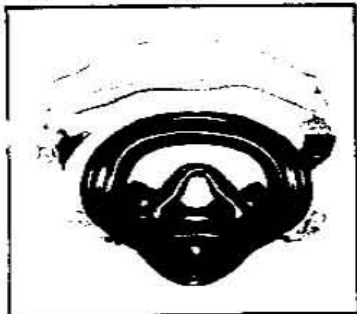


FIGURE 10



FIGURE 11

- c. Carefully wash the facepiece assembly with Scott Multi-Wash Mini and thoroughly rinse in clean water. If the facepiece is heavily soiled, it may be necessary to first wash facepiece with warm (110° F maximum) soap or detergent solution.
- d. Disinfect the facepiece by one of the following methods:
 1. Sponge mask with a 70% solution of isopropyl alcohol.
or
 2. Spray 3 full pumps of Scott Multi-Wash Mini on the regulator side of mask and 3 full pumps on the inside of the mask, wetting entire mask including all rubber and plastic areas. Allow a 10 minute contact time to disinfect prior to rinsing.
- e. Thoroughly rinse with potable water using a spray bottle or gently running water. Shake excess water off of facepiece and then dry 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.
- f. For cleaning mask-mounted regulator, please use instruction sheet P/N 89346-01. This sheet is available upon request from Scott Health and Safety.
- g. Check to ensure gasket is present between facepiece and mask-mounted regulator and is not damaged.
- h. Connect the regulator to the facepiece. With the red purge valve in the 12 o'clock position, align the two flats of the outlet port with corresponding flats in the facepiece port and insert. Rotate the regulator counterclockwise (viewed from inside of facepiece) so that the red purge valve knob is situated on the left side of the facepiece. The lock tab on the mask-mounted regulator will lock into the facepiece retainer with a "click." If properly engaged, the regulator will not rotate.
- i. To re-attach a breathing regulator equipped with a quick disconnect to the respirator: (See Figure 7)
 - a) While holding the socket behind the plastic guard, insert plug "D" into the socket body until engaged as evidenced by the sleeve moving forward with a sharp "click."
 - b) After the "click," rotate the sleeve by hand 1/4 to 1/2 turn so that notch does not line up with the rivet head.
 - c) Test for positive engagement by tugging on the coupling.
- j. Damp-sponge dirt accumulations from the rest of the respirator.
- k. Place the respirator in the carrying case, making sure all components are thoroughly dry.

CAUTION

CERTAIN CLEANING AND DISINFECTING AGENTS SUCH AS QUATERNARY AMMONIUM COMPOUNDS (AMMONIUM CHLORIDES) MAY CAUSE DAMAGE, DETERIORATION OR ACCELERATED AGING TO PARTS OF THE RESPIRATOR. USE ONLY THE RECOMMENDED CLEANING AND DISINFECTING AGENTS.

CAUTION

FAILURE TO THOROUGHLY RINSE AND COMPLETELY DRY THE ENTIRE FACEPIECE ASSEMBLY MAY ALLOW A BUILDUP OF DETERGENTS AND/OR DISINFECTING AGENTS WHICH COULD DAMAGE FACEPIECE COMPONENTS.

2. If during use, the respirator is suspected of being contaminated by hazardous substance, the contaminate must be identified and properly removed or the contaminated component(s) must be replaced before next use. Dispose of the contaminate or the contaminated component(s) in accordance with applicable regulatory requirements.
3. If any damage or deterioration is noted, remove the respirator from service and tag for repair.
4. Where an SCBA, tools or equipment are carried within enclosed seating areas of fire department or other safety vehicles, such items shall be secured by either a positive mechanical means of holding the item in its stowed position or in a compartment with a positive latching door. The means of holding the item in place or the compartment shall be designed to minimize injury to persons in the enclosed area of the vehicle caused by loose equipment during travel and in the event of an accident, a rapid deceleration, or a rapid acceleration.

BEACON ALARM BATTERY REPLACEMENT

The Beacon Alarm Battery should be replaced only by a trained maintenance technician in a clear area known to be nonflammable as follows:

1. Remove the breathing regulator from the facepiece.
2. On the Beacon Alarm, roll the rubber boot up onto itself to expose the thin rubber gasket between the hose fitting and the Beacon Alarm Cap.
3. Hold the unit with the Beacon Alarm pointing up and remove the Beacon Alarm Cap by unscrewing it counter-clockwise. Be careful not to lose the thin rubber gasket at the base of the threads.
4. With the Beacon Alarm Cap off, tip the regulator over to drop the old battery out of the holder.
5. Replace with new 3V battery (PN# 10010227). Place battery in holder with "+" side up (printed side up).
6. Make sure the thin rubber gasket (PN# 10010906) is pushed all the way down to the step at the bottom of the threads.
7. Thread the Beacon Alarm Cap back on making sure the thin rubber gasket is compressed flat beneath Cap. Hand tighten only.
8. Slide the boot back over the gasket and hand tighten once more.
9. Test the operation of the Beacon as outlined in the Regular Operational Inspection section of this instruction.
10. In the case of an inoperative or malfunctioning Beacon Alarm, respirator must be removed from service and sent to an authorized service center for alarm repair or replacement. **DO NOT** use a respirator with an inoperative or malfunctioning Beacon Alarm.

WARNING

TO REDUCE THE RISK OF IGNITION OF A FLAMMABLE ATMOSPHERE, BATTERIES MUST ONLY BE CHANGED IN AN AREA KNOWN TO BE NONFLAMMABLE

WARNING

SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.

RESPIRATOR MARKINGS

Do not remove, obscure or alter any labels on SCBA or SCBA cylinders.

PERIODIC TESTING

Scott recommends that this respirator be checked, both visually and functionally, by a Scott Authorized Service Center using Scott Authorized Test Equipment at least every two years. However, heavy use may require more frequent testing. This recommendation is in addition to all other cleaning and maintenance procedures. A manual covering the maintenance of this respirator is available on request from Scott Health and Safety.

ACCESSORIES

1. Lens Kit, P/N 804442-01, allows installation of corrective lenses in facepiece. Frame is provided.
2. Neck Strap, P/N 804088-01, is used to hold facepiece in a ready position.
3. Hard carrying case, P/N 804497-01, and soft carrying case, P/N 10009324, are used to store and transport respirator.
4. Duration Extending Accessory Hose Assembly is used for the purpose of extending duration by means of a low pressure airline air supply. It is available in the following configurations;

Accessory Hose	Terminates in:
P/N 27537-01	Hansen 3000 series male plug
P/N 27537-02	Schrader plug
P/N 27537-03	Hansen 2-HK plug
P/N 27537-04	Hansen 2-HK socket

Configurations of air supply hoses and fittings (26369 series, 26370 series, 30010 series and 30020 series) are available for attachment to accessory hose assemblies. Instruction Sheet, P/N 89167-01, included with each accessory hose assembly, contains information required for operation.

NOTE

Only respirators equipped with a dual outlet reducer can have the accessory hose installed.

5. Gauge Protector Kit, P/N 10008500, provides the remote reading pressure gauge with protection from impact and abrasion.
6. Facepieces for the respirator are available in three sizes:

Facepiece w/ Kevlar Head Harness: Small..... P/N 804191-01 Large..... P/N 804191-02 Extra Large..... P/N 804191-03 Comfort Seal..... P/N 804191-08	Facepiece w/ Four-Point Head Harness (AV2-4PNS): Small..... P/N 804871-01 Comfort Seal..... P/N 804871-02 Extra Large..... P/N 804871-03
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7. Clear protective Lens Cover, P/N 803941-25 (package of 25), is used to protect full facepiece lens against external scratching, spatter, paint spray and abrasion.
8. All-Pro Voice Amplification/Radio Interface Communication System, 803896 series, is used to provide communication between personnel wearing Scott respirators.
9. Pak-Alert 1000 Distress Alarm, P/N 804385-01, provides audible and visual alarms to aid in locating a respirator user in distress. Fully integrated into the SCBA, the system automatically actuates when the cylinder valve is opened. The sensor will alarm after detecting no motion for 30 seconds. Refer to Operation and Maintenance Manual 89307-01 for details of operation.
10. Suit Pass-Thru Assembly, 803620 series, provides a means of delivering respirable air to specific Scott SCBA worn in combination with a protective garment or suit.
11. Fit Testing Accessories:
 Probed Twin Cartridge Adapter (Qualitative), P/N 803930-01; Twin Cartridge Adapter (Qualitative), P/N 804057-01; High Efficiency Particulate Filter (HEPA), P/N 642-H; and Organic Vapors & HEPA, P/N 642-OV-H.
12. Emergency Breathing Support System (EBSS) allows 2 users of similarly equipped Air-Paks to share a common air supply in the event one user has an emergency.
13. Regulator Holder, P/N 10008880, attaches to the waist belt to conveniently keep the E-Z Flo Regulator secure and clean when not in use.
14. Shoulder & Hip Pad Kit, P/N 803810-01, attaches to and provides maximum comfort for user of Back-Pak assembly P/N 804173-01.
15. Weld-O-Vista Welding Kit, 804224-series, is designed to provide vision protection for welders using Air-Pak respirators. Note, Kit cannot be used with optional AV-2000 Facepiece with mask mounted exhalation valve.
16. Quick Charge Assembly and Charging Wand Assembly provides a means to charge cylinders without removing the cylinder from the respirator. See NIOSH approval label.
17. Optional Bell Alarm is a redundant end-of-service alarm provides an audible alarm to warn the user of diminishing air supply. Bell Alarm 805090-01 is for use on units without the Quick Charge Assembly and Bell Alarms 805090-02 and 805090-03 are for use on units with the Quick Charge Assembly.

CAUTIONS AND LIMITATIONS

AIR-LINE RESPIRATORS CAN BE USED ONLY WHEN THE RESPIRATORS ARE SUPPLIED WITH RESPIRABLE AIR MEETING THE REQUIREMENTS OF CGA G-7.1 GRADE D OR HIGHER QUALITY.

USE ONLY THE PRESSURE RANGES AND HOSE LENGTHS SPECIFIED IN THE USER'S INSTRUCTIONS.

CONTAINS ELECTRICAL PARTS WHICH HAVE NOT BEEN EVALUATED AS AN IGNITION SOURCE IN FLAMMABLE OR EXPLOSIVE ATMOSPHERES BY MSHA/NIOSH.

FAILURE TO PROPERLY USE AND MAINTAIN THIS PRODUCT COULD RESULT IN INJURY OR DEATH.

ALL APPROVED RESPIRATORS SHALL BE SELECTED, FITTED, USED AND MAINTAINED IN ACCORDANCE WITH MSHA, OSHA AND OTHER APPLICABLE REGULATIONS.

NEVER SUBSTITUTE, MODIFY, ADD OR OMIT PARTS. USE ONLY EXACT REPLACEMENT PARTS IN THE CONFIGURATION AS SPECIFIED BY THE MANUFACTURER.

REFER TO USER'S INSTRUCTIONS AND/OR MAINTENANCE MANUALS FOR INFORMATION ON USE AND MAINTENANCE OF THESE RESPIRATORS.

SPECIAL OR CRITICAL USER'S INSTRUCTIONS AND/OR SPECIFIC USE LIMITATIONS APPLY. REFER TO INSTRUCTION MANUAL BEFORE DONNING.

SPECIFIC LIMITATIONS

ALL MODELS OF THE SCOTT 2.2 OR 3.0 OR 4.5 ARE APPROVED FOR RESPIRATORY PROTECTION DURING ENTRY INTO OR ESCAPE FROM OXYGEN DEFICIENT ATMOSPHERES, GASES AND VAPORS, AT TEMPERATURES ABOVE -25°F.

WHEN USING FACEPIECE 803921-01, 803921-02, OR 803921-03 AT TEMPERATURES BELOW 32°F ADD OPTIONAL NOSECUP ASSEMBLY 802819-01.

SEE LOW TEMPERATURE OPERATION SECTION OF THIS INSTRUCTION MANUAL FOR ADDITIONAL INFORMATION.

ALL MODELS ARE APPROVED ONLY WHEN COMPRESSED AIR RESERVOIR IS FULLY CHARGED WITH AIR MEETING THE REQUIREMENTS OF THE COMPRESSED GAS ASSOCIATION SPECIFICATION G-7.1 FOR TYPE 1, GRADE D AIR, OR EQUIVALENT SPECIFICATIONS.

THE CONTAINER SHALL MEET APPLICABLE DOT SPECIFICATIONS.

SEE THE REGULATOR OPERATIONAL INSPECTION SECTION OF THE INSTRUCTION MANUAL FOR ADDITIONAL INFORMATION.

TO USE THE DURATION EXTENDING ACCESSORIES, THE SUIT VENTILATION ACCESSORY (HOSE 803801-01 AND STRAP 804082-01) OR THE APPLIANCE ACCESSORY (HOSE 803801-02) THE RESPIRATOR MUST BE EQUIPPED WITH DUAL OUTLET REDUCER.

WHEN USING THE ACCESSORY HOSE ASSEMBLY TO EXTEND DURATION OF USE, REFER TO SCOTT OPERATING INSTRUCTIONS PART NUMBER 89187-01 FOR LENGTH OF HOSE AND AIR PRESSURE REQUIRED FOR OPERATION.

THE SUIT VENTILATION HOSE AND THE APPLIANCE HOSE MUST BE DISCONNECTED WHEN NOT UTILIZING THE DURATION EXTENDING SUPPLY HOSE, EXCEPT WHEN THE RESPIRATOR INCLUDES A ONE HOUR RATED CYLINDER (PART NUMBER 803624-01, 804106-01 OR 804255-01). WHEN A ONE HOUR RATED CYLINDER IS USED WITH NO DURATION EXTENDING AIR LINE TO SUPPLY A SUIT VENTILATION ACCESSORY THE RESPIRATOR IS RATED FOR 30 MINUTES DURATION.

WHEN THE PAK ALERT ACCESSORY IS USED CYLINDER AND VALVE ASSEMBLY 802827-01 OR 804107-01 (ONE HOUR FIBERGLASS WRAPPED CYLINDER SHOULD NOT BE USED AS THE WEIGHT OF THE RESPIRATOR MAY EXCEED THE NIOSH LIMIT OF 35 LBS).

THE GAUGE PROTECTION ACCESSORY DOES NOT APPLY WHEN THE PAK ALERT 1000 ACCESSORY IS INSTALLED.

HIP AND SHOULDER PAD ACCESSORY IS INTENDED FOR USE WITH THE BACKFRAME 804173-01, 804173-02 and 804173-03 ONLY.

THE WELD-O-VISTA ACCESSORY (804224-01) AND THE WELDING HOOD ARE FOR USE WITH THE E-2 FLO REGULATORS AND PRESSURE DEMAND REGULATORS ONLY.

THE SCOTT VOICE AMPLIFIER CAN ONLY BE USED WITH THE AV-2000 FACEPIECE 804019-01, 804019-02, 804019-03, 804019-05, 804019-06, OR 804019-07.

BELL ALARM 805090-01 IS FOR USE ON AIR-PAKS WITHOUT THE QUICK CHARGE ACCESSORY. BELL ALARMS 805090-02 AND 805090-03 ARE FOR USE ON AIR-PAKS WITH QUICK CHARGE ACCESSORY.

WARNING

IMPROPER USE OF A RESPIRATOR MAY RESULT IN PERSONAL INJURY OR DEATH. IMPROPER USE INCLUDES, BUT IS NOT LIMITED TO, USE WITHOUT TRAINING, DISREGARD OF THE WARNINGS AND INSTRUCTIONS SUPPLIED WITH THE RESPIRATOR AND ITS ACCESSORIES AND FAILURE TO INSPECT AND MAINTAIN THE RESPIRATOR. READ AND UNDERSTAND THE INSTRUCTION MANUAL AND ANY APPLICABLE ACCESSORY INSTRUCTIONS AND WARNINGS BEFORE ATTEMPTING TO USE A RESPIRATOR.

This supercedes the following instruction manuals:

89216-01	89289-01
89217-01	89290-01
89246-01	89291-01
89287-01	89292-01
89288-01	89339-01



89342-01 Rev C 11/98

SCOTT®

Health and Safety Products
309 W. Crowell Street • Monroe, NC 28112-4649
Telephone: 704-282-8400 • Fax: 704-282-8423

Printed in USA

BELL ALARM ASSEMBLY, P/N 805090-Series
FITTED TO SCOTT AIR-PAK® 2.2/3.0/4.5
SELF CONTAINED BREATHING APPARATUS.



Bell Alarm mounted on an Air-Pak® 4.5

WARNING

THIS SCOTT BELL ALARM IS INTENDED FOR USE WITH A SCOTT AIR-PAK RESPIRATOR SELF-CONTAINED BREATHING APPARATUS (SCBA) WHICH MAY SUPPORT HUMAN LIFE IN HAZARDOUS ATMOSPHERES. FAILURE TO CAREFULLY READ AND UNDERSTAND THE FOLLOWING INSTRUCTIONS MAY RESULT IN PERSONAL INJURY OR DEATH TO THE SCBA USER.

USE OF A RESPIRATOR INTEGRATED WITH A BELL ALARM WILL REQUIRE MODIFICATION OF THE RESPIRATOR "REGULAR OPERATIONAL INSPECTION" PROCEDURE AND WILL REQUIRE TRAINING OF THE RESPIRATOR USER IN THE USE OF THE BELL ALARM. FOLLOW THE REGULAR OPERATIONAL INSPECTION PROCEDURE AS OUTLINED IN THE AIR-PAK OPERATING AND MAINTENANCE INSTRUCTIONS (89342-01) AS WELL AS THE INSTRUCTIONS CONTAINED HEREIN.

WARNING

THE INFORMATION BELOW IS MEANT TO SUPPLEMENT, NOT REPLACE, THE INSTRUCTIONS, TRAINING, SUPERVISION, MAINTENANCE, AND OTHER ELEMENTS OF YOUR ORGANIZED RESPIRATORY PROTECTION PROGRAM. FAILURE TO UNDERSTAND THE OPERATION OF A RESPIRATOR COULD RESULT IN PERSONAL INJURY OR DEATH.

INTRODUCTION

The SCOTT Bell Alarm is an optional end-of-service alarm mounted on the front of an AIR-PAK respirator which provides an audible bell alarm to warn the user of diminishing air supply. When the Bell Alarm actuates, it warns the user that approximately 25% of the full pressure remains in the cylinder and that the user should leave the contaminated or hazardous area at once. The bell will ring rapidly at first, but the bell rate will slow as the remaining pressure is depleted from the cylinder.

The Bell Alarm is a high pressure device that works independently of Scott's low pressure Vibralert or Beacon Alarms.

Be sure to identify which alarms are present on the respirator you are using and to understand their operation before using the respirator. **NOTE:** The Beacon Alarm shall be standard on all units produced after January 1, 1999.

Use of a SCOTT AIR-PAK respirator integrated with a Bell Alarm will require modification of the organized respiratory protection program and will require training of the respirator user in the use of the Bell Alarm. Follow the inspection, use, and maintenance procedures as outlined in the SCOTT AIR-PAK Operating and Maintenance Instructions (89342-01) as well as the additional instructions contained herein.

REGULAR OPERATIONAL INSPECTION

The following steps shall be included in the "Regular Operational Inspection" of the SCOTT AIR-PAK Respirator on which a Bell Alarm is installed. Refer to the REGULAR OPERATIONAL INSPECTION section of the SCOTT AIR-PAK Operating and Maintenance Instructions (89342-01) and identify the steps that must be modified as described herein:

1. Visually inspect the Bell Alarm for damage.
2. Slowly open the cylinder valve by fully rotating knob counterclockwise.
3. The Bell Alarm may ring once during pressurization then stop.
4. Inspect the operation of all other alarms as described in the Regular Operational Inspection procedure.
5. If the Bell Alarm does not stop ringing, remove the respirator from service and tag for repair by authorized personnel.

WARNING

WHEN THE BELL ALARM ACTUATES, IT WARNS THE USER THAT APPROXIMATELY 25% OF FULL PRESSURE REMAINS IN THE AIR CYLINDER (THAT IS, APPROXIMATELY 3/4 OF THE TOTAL AIR SUPPLY HAS BEEN USED). IT SERVES AS AN ALARM TO WARN ONLY OF LOW AIR SUPPLY. WHEN THE BELL ALARM ACTUATES, LEAVE THE CONTAMINATED AREA AT ONCE.

WARNING

FOLLOW THE REGULAR OPERATIONAL INSPECTION PROCEDURE EXACTLY. IF THE BELL ALARM, VIBRALERT, OR ANY OTHER ALARM DOES NOT ACTUATE AS DESCRIBED, OR IF ANY OTHER OPERATIONAL MALFUNCTION IS NOTED, DO NOT USE THE RESPIRATOR.

WARNING

IF THE BELL ALARM DOES NOT STOP RINGING, DO NOT USE THE RESPIRATOR. REMOVE IT FROM SERVICE AND TAG FOR REPAIR BY AUTHORIZED PERSONNEL.

USE OF RESPIRATOR

The following steps shall be included in the "Use of Respirator" training of personnel using the SCOTT AIR-PAK Respirator on which a Bell Alarm is installed. Refer to the USE OF RESPIRATOR section of the SCOTT AIR-PAK Operating and Maintenance Instructions (89342-01) and identify the steps that must be modified as described herein:

1. Don the respirator as described in the Operating and Maintenance Instructions.
2. Slowly open the cylinder valve by fully rotating knob counterclockwise.
3. The Bell Alarm may ring once during pressurization then stop.
4. All other alarms shall operate as described in the Regular Operational Inspection procedure.
5. Proceed with use of respirator in accordance with your respiratory protection program.

EVERY ENTRY INTO A CONTAMINATED OR UNKNOWN ATMOSPHERE SHOULD BE PLANNED TO ENSURE THAT THERE IS SUFFICIENT AIR SUPPLY TO ENTER, CARRY OUT THE TASKS REQUIRED AND RETURN TO A SAFE BREATHING AREA. THE USER SHOULD CHECK THE REMOTE READING PRESSURE GAUGE ON THE SHOULDER STRAP PERIODICALLY TO DETERMINE THE RATE OF AIR CONSUMPTION. IN ANY EVENT, THE USER MUST BE CERTAIN TO ALLOW SUFFICIENT AIR FOR EGRESS FROM THE CONTAMINATED AREA. IF ENTRY IS ATTEMPTED AFTER THE AIR HAS BEEN PARTIALLY CONSUMED (CYLINDER LESS THAN FULL), THE USER MUST BE CERTAIN THAT THE REMAINING AIR WILL BE SUFFICIENT FOR SAFETY.

THE VIBRALERT ALARM AND THE BELL ALARM NOTIFY THE USER THAT APPROXIMATELY 25% OF FULL PRESSURE REMAINS IN THE CYLINDER, HOWEVER, THE ALARMS MAY NOT ACTUATE SIMULTANEOUSLY. IF ANY ALARM ACTUATES DURING USE OF THE RESPIRATOR, LEAVE THE CONTAMINATED AREA AT ONCE.

Leave the contaminated or unknown atmosphere immediately if the Vibralert alarm, the Beacon Alarm (if installed), or the Bell Alarm actuates, and, in a safe area, determine cause of alarm. When air supply has been depleted, replace cylinder following CYLINDER REPLACEMENT PROCEDURE.

WARNING

THE VIBRALERT ALARM AND THE BELL ALARM BOTH NOTIFY THE USER THAT APPROXIMATELY 25% OF FULL PRESSURE REMAINS IN THE CYLINDER, HOWEVER, THE ALARMS MAY NOT ACTUATE SIMULTANEOUSLY. IF ANY ALARM ACTUATES DURING USE OF THE RESPIRATOR, LEAVE THE CONTAMINATED AREA AT ONCE.

TERMINATION OF USE

The following steps shall be included in the "Termination of Use" training of personnel using the SCOTT AIR-PAK Respirator on which a Bell Alarm is installed. Refer to the TERMINATION OF USE section of the SCOTT AIR-PAK Operating and Maintenance Instructions (89342-01) and identify the steps that must be modified as described herein:

1. Leave the contaminated area or be certain respiratory protection is no longer required
2. Doff the respirator as described in the Operating and Maintenance Instructions.
3. When respirator operations are completed and only in a safe breathing area, check that the cylinder valve is closed and vent the residual air from the respirator by opening the purge valve. After waiting until the air flow stops, close the purge valve.
4. Proceed in accordance with your respiratory protection program for service of the respirator.

EMERGENCY OPERATION

The following steps shall be included in the "Emergency Operation" training of personnel using the SCOTT AIR-PAK Respirator on which a Bell Alarm is installed. Refer to the EMERGENCY OPERATION section of the SCOTT AIR-PAK Operating and Maintenance Instructions (89342-01) and identify the steps that must be modified as described herein:

1. Should the Bell Alarm actuate during use before the air supply is depleted to approximately 25% of full capacity, LEAVE THE CONTAMINATED AREA AT ONCE ON ACTUATION OF THE BELL ALARM.
2. Should any alarm actuate during use before the air supply is depleted to approximately 25% of full capacity, LEAVE THE CONTAMINATED AREA AT ONCE ON ACTUATION OF ANY ALARM.

MAINTENANCE

The Bell Alarm assembly unit is not field repairable. In the case of failure or malfunction of the Bell Alarm, the respirator must be sent to an authorized service center for alarm repair or replacement. **DO NOT** use a respirator with an inoperative or malfunctioning Bell Alarm.

WARNING

WHEN THE BELL ALARM ACTUATES, LEAVE THE CONTAMINATED AREA AT ONCE.

WARNING

THE BELL ALARM ASSEMBLY UNIT IS NOT FIELD REPAIRABLE. IN THE CASE OF FAILURE OR MALFUNCTION OF THE BELL ALARM, THE RESPIRATOR MUST BE SENT TO AN AUTHORIZED SERVICE CENTER FOR ALARM REPAIR OR REPLACEMENT. DO NOT USE A RESPIRATOR WITH AN INOPERATIVE OR MALFUNCTIONING BELL ALARM



89364-01 Rev. B 4/99

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HEALTH/SAFETY
PRODUCTS

OPERATION AND MAINTENANCE INSTRUCTIONS FOR AIR-PAK® 2.2/3.0/4.5 SELF-CONTAINED BREATHING APPARATUS (SCBA) INTEGRATED WITH SCOTT PAK-ALERT™ SE DISTRESS ALARM

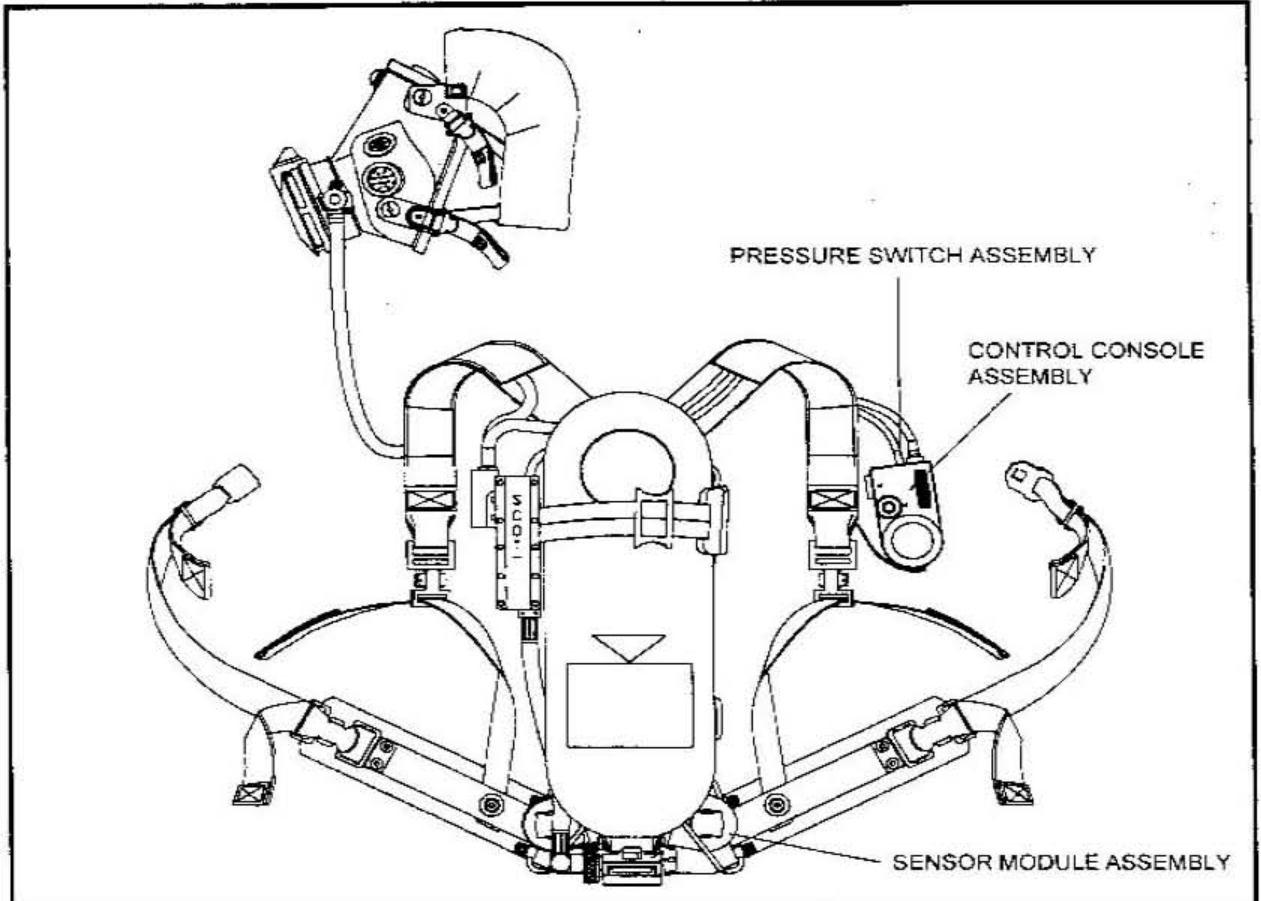


FIGURE 1
TYPICAL 2.2/3.0/4.5 SCBA WITH PAK-ALERT SE DISTRESS ALARM ASSEMBLY, P/N 805179-01

WARNING

THE SCOTT PAK-ALERT SE DISTRESS ALARM IS INTENDED FOR USE WITH SCOTT SELF-CONTAINED BREATHING APPARATUS (SCBA) WHICH MAY SUPPORT HUMAN LIFE IN HAZARDOUS ATMOSPHERES. FAILURE TO CAREFULLY READ AND UNDERSTAND THE FOLLOWING INSTRUCTIONS MAY RESULT IN PERSONAL INJURY OR DEATH TO THE SCBA USER.

USE OF A RESPIRATOR INTEGRATED WITH A PAK-ALERT SE DISTRESS ALARM WILL REQUIRE MODIFICATION OF THE RESPIRATOR "REGULAR OPERATIONAL INSPECTION PROCEDURES" AND WILL REQUIRE TRAINING OF THE RESPIRATOR USER IN THE USE OF PASS EQUIPPED RESPIRATORS.

THE FOLLOWING INSTRUCTIONS SUPPLEMENT BUT DO NOT REPLACE THE OPERATING AND MAINTENANCE INSTRUCTIONS SUPPLIED WITH EACH RESPIRATOR.

OPERATION WITH A PAK-ALERT SE DISTRESS ALARM INSTALLED.
QUICK REFERENCE GUIDE TO USE:

WHEN YOU WANT TO:	YOU DO:	THE PAK-ALERT SE DISTRESS ALARM DOES:
Turn it on.	Open cylinder valve (cylinder <u>must</u> have air in it).	3 quick audible chirps, green flashing light on control console
Re-set pre-alarm	Move so that the respirator moves	Red flashing light changes to green, ascending/ descending tone stops.
Re-set full alarm.	Press re-set button on control console twice (push, release, push again).	Loud 3 tone chirp stops, 3 quick chirps, then red flashing light changes to green flashing light.
Turn it off (finished with use).	Close respirator cylinder valve, open regulator purge valve letting out all the trapped air, close regulator purge valve, press re-set button twice.	The flashing light goes out and a fifteen second beep sequence occurs as the residual air bleeds off. Unit will sound a two tone chirp at turn off.
Turn on the manual alarm.	Press alarm button on control console (works whether the PAK-ALERT SE distress alarm is on or off).	Goes into full alarm, loud 3 tone chirp from sensor module and bright <u>red</u> flashing light from control console.
WHEN THE PAK-ALERT SE DISTRESS ALARM IS:	IT INDICATES THAT:	
Quiet, no lights or sound.	The Pak-Alert SE distress alarm is off or the batteries are used up or removed.	
Flashing the green light	The Pak-Alert SE distress alarm is on, in automatic mode, and monitoring your motion.	
Flashing the red light and sounding an ascending/descending tone.	You have not moved in the last 20 seconds, Pak-Alert SE distress alarm will go into full alarm in 10 seconds or less if you do not move.	
Flashing the red light and sounding a loud continuous 3 tone chirp.	Full alarm: You have not moved in the last 30 seconds or more or you pushed the manual alarm button.	
Chirping once every 2 seconds with no light flashing.	The batteries are low. You must put in new batteries before using the Pak-Alert SE distress alarm again (it will work in low battery condition long enough to let you finish the cylinder of air you are on).	

INTRODUCING THE SCOTT PAK-ALERT SE DISTRESS ALARM

The Scott PAK-ALERT SE distress alarm is an optional accessory which is intended to be integrated only with Scott AIR-PAK® 2.2, 3.0 or 4.5 Self-Contained Breathing Apparatus (SCBA). The PAK-ALERT SE distress alarm is a PERSONAL ALERT SAFETY SYSTEM (PASS) intended to assist in locating a respirator user who is incapacitated or in need of assistance.

The installation of the Scott PAK-ALERT SE distress alarm is approved by the National Institute of Occupational Safety and Health (NIOSH) on all models of Scott AIR-PAK 2.2, 3.0 or 4.5 SCBA. One limitation is that one hour duration 4.5 models must use either a Kevlar® or Carbon wrapped cylinder and valve assembly. Limitations of use specified on the SCBA approval label and in the SCBA Operating and Maintenance Instructions, apply to the PAK-ALERT SE distress alarm when installed on an Air-Pak 2.2, 3.0 or 4.5 SCBA.

NIOSH certified SCBA's are limited to a maximum weight of 35 lbs. When using the PAK-ALERT SE distress alarm with a one hour duration Scott SCBA, either the Kevlar (P/N 804222-01) or carbon (P/N 804723-01) wrapped cylinder and valve assembly must be used to keep the total weight under 35-pound limit. Fiberglass wrapped one hour cylinder and valve assemblies, Scott part number 804107-01 or 802827-01, when used with a one hour model 4.5 with the PAK-ALERT SE distress alarm installed will exceed 35 lbs.

The Scott PAK-ALERT SE distress alarm, when added to a Scott 2.2, 3.0 or 4.5 respirator, as shown in Figure 1, consists of a sensor module mounted to the bottom of the respirator backframe, a pressure switch mounted between the cylinder and gauge line, and a control console mounted on the wearer's right shoulder strap at the pressure gauge location.

Installation of a Scott PAK-ALERT SE distress alarm requires some disassembly of the respirator. Installation instructions are contained in a separate Scott Instruction Manual, P/N 89389-01, available from Scott Aviation, 309 W. Crowell street, Monroe, N.C. 28112.

HOW THE SCOTT PAK-ALERT SE DISTRESS ALARM WORKS:

Provided proper batteries have been installed and the cylinder has air in it, the PAK-ALERT SE distress alarm device is automatically activated when the respirator is pressurized by opening the cylinder valve of the respirator.

Activation is indicated by 3 quick audible chirps from the sensor module. On activation, a green light located on the control console, shown in Figure 2, will begin to flash approximately once a second. The PAK-ALERT SE distress alarm is now in what is called the automatic mode.

*Kevlar is a registered trademark of E.I. Du Pont de Nemours, Inc.

WARNING

NO PERSONAL ALERT SAFETY SYSTEM, RESPIRATOR OR COMBINATION OF PERSONAL ALERT SAFETY SYSTEM AND RESPIRATOR, BY THEMSELVES, CAN PROVIDE COMPLETE PROTECTION IN FIRE SITUATIONS. HOWEVER, USING AN ALARM AND A RESPIRATOR IN ACCORDANCE WITH THE REQUIREMENTS OF AN ORGANIZED RESPIRATORY PROTECTION PROGRAM IS ONE OF THE MANY SAFETY PRECAUTIONS WHICH SHOULD BE TAKEN TO AVOID PERSONAL INJURY OR DEATH.

NOTE

USE ONLY IN ACCORDANCE WITH NFPA 1500, "STANDARD ON FIRE DEPARTMENT OCCUPATIONAL SAFETY AND HEALTH PROGRAM."

WARNING

THE INFORMATION BELOW IS MEANT TO SUPPLEMENT, NOT REPLACE, THE INSTRUCTIONS, TRAINING, SUPERVISION, MAINTENANCE, AND OTHER ELEMENTS OF YOUR ORGANIZED RESPIRATORY PROTECTION PROGRAM. SEE WARNING ON FIRST PAGE OF THIS DOCUMENT.

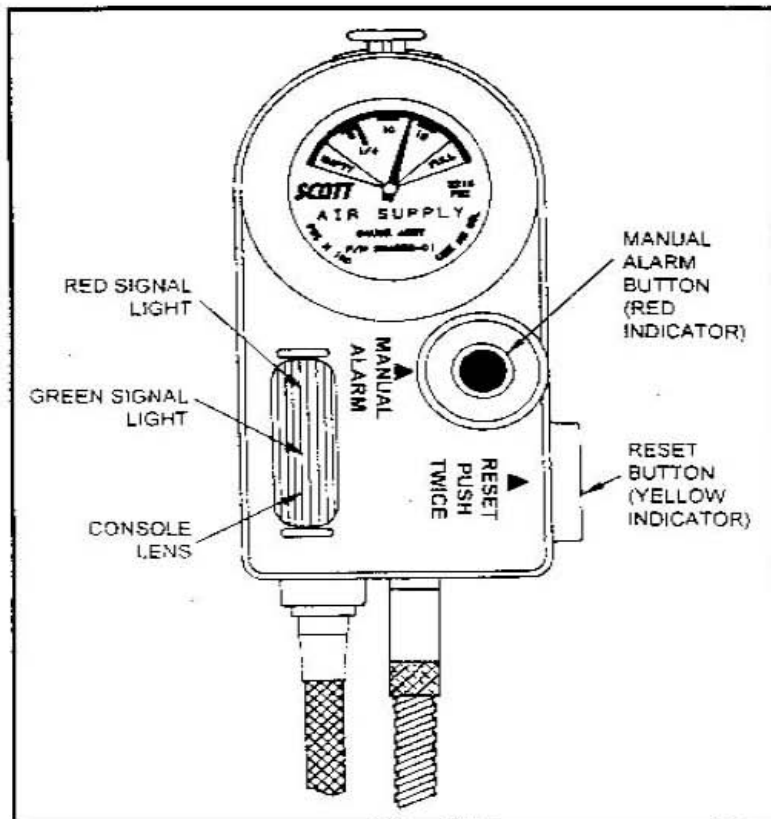


FIGURE 2
THE CONTROL CONSOLE

If the batteries are in need of replacement, the PAK-ALERT SE distress alarm will indicate low battery voltage by a single audible chirp from the sensor module once every 2 seconds. In a low battery condition, the green light on the control module will not flash. However, the PAK-ALERT SE distress alarm will continue to operate normally even though the green flashing light is not illuminated. If batteries are completely discharged or have not been installed, there will be no light or sound which indicates that the unit will not work at all.

Once activated, the Scott PAK-ALERT SE distress alarm will remain activated until:

1. The respirator air cylinder is turned off with the residual air pressure purged from the regulator

AND

2. The reset button on the control module has been pressed twice.

In the automatic mode the Scott PAK-ALERT SE distress alarm constantly monitors motion of the respirator backframe. The motion sensor is located in the sensor module along with the audible alarm. If the sensor module does not sense motion of the respirator for 20 seconds the PAK-ALERT SE distress alarm will signal a pre-alarm condition. If there is still no motion of the respirator for the next 8 to 10 seconds the full alarm will sound.

PRE ALARM:

Once the respirator is pressurized, the PAK-ALERT SE distress alarm will automatically sound a pre-alarm if the respirator remains motionless for more than 20 seconds.

When the pre-alarm occurs, the green flashing light on the control console is replaced by a bright red light which flashes approximately once a second and is accompanied by an ascending/descending audible tone which increases in volume during the pre-alarm cycle.

If the user is not incapacitated or not in need of assistance, the pre-alarm is normally reset by movement of the respirator. When reset, the flashing red light will be replaced by the flashing green and the ascending/descending tone will stop.

A pre-alarm may also be reset by pressing and holding the reset button on the side of the control console until three (3) quick audible chirps are heard and the red flashing light on the control console is replaced by the green flashing light.

Remember that the motion sensor is in the sensor module under the air cylinder valve and not in the control console so that actual movement of the respirator backframe is required for reset. Shaking the control console will not reset the PAK-ALERT SE distress alarm.

FULL ALARM:

If the user is incapacitated or in need of assistance and can not move, the PAK-ALERT SE distress alarm will go into full alarm 8 to 10 seconds after the pre-alarm starts.

Full alarm is indicated by a loud, almost continuous 3 tone chirp from the sensor module accompanied by the flashing of the red signal light on the control console. The full alarm condition can only be cleared by manually pressing twice on the reset button, located on the side of the control console, shown in Figure 2.

After the full alarm has been silenced by pressing the reset button, releasing it and pressing it again, the PAK-ALERT SE distress alarm will remain activated with the green light flashing once per second. In the activated or "automatic" mode, it will again go into pre-alarm followed by full alarm unless there is movement of the respirator at least once every 20 seconds as long as the respirator is pressurized.

MANUAL ALARM:

If the respirator user is in a situation where immediate assistance is required, the PAK-ALERT SE distress alarm provides a manual alarm button, located on the front of the control console on the user's right shoulder, shown in Figure 2.

The manual alarm causes the Full Alarm signal to be given. The manual alarm may be activated by pressing the manual alarm button at any time, even when the respirator is not pressurized, provided good batteries are in the PAK-ALERT SE distress alarm. If the manual alarm button has been pressed without the respirator pressurized, the alarm can be silenced by pressing the reset button twice. The PAK-ALERT SE distress alarm is now on and in automatic mode. To turn the unit off, press the reset twice again while the unit is not in alarm mode.

TURNING THE PAK-ALERT SE DISTRESS ALARM OFF:

The PAK-ALERT SE distress alarm can not be turned off if the respirator cylinder valve is open and/or pressure remains in the respirator. Pressing the reset button when the respirator is pressurized will only reset an alarm condition and return the PAK-ALERT SE distress alarm to automatic mode. When the use of the PAK-ALERT SE distress alarm and respirator is no longer required, first close the cylinder valve on the respirator, then vent the residual air from the respirator system by opening the regulator purge valve. After waiting until the air flow stops, close the regulator purge valve and turn off the PAK-ALERT SE distress alarm by pressing the reset button twice. The green flashing light will go out, a fifteen second beep sequence will be heard from the sensor module as the residual air bleeds from the system. After the air has completely bled from system, the unit will sound a quick two tone chirp and the PAK-ALERT SE distress alarm will be inactive.

If the respirator is turned off and depressurized without pressing the reset button twice, the PAK-ALERT SE distress alarm will continue to monitor motion in automatic mode. This means that the PAK-ALERT SE distress alarm may be used to monitor motion after the respirator is turned off and depressurized. Resetting the full alarm after the respirator has been depressurized will not turn off the PAK-ALERT SE distress alarm. The reset switch must be depressed twice with no alarm condition to turn off the PAK-ALERT SE distress alarm (the fifteen second beep sequence and two tone chirp should be heard).

Remember, the loud audible alarm and flashing red light can be turned on at any time by pressing the manual alarm button on the control console.

LOW BATTERY:

If, while using the respirator, the batteries begin to approach the end of their useful life, the sensor module will begin to sound a chirp approximately every two seconds, and the green light on the control module will go out. This is the low battery condition. In this condition the PAK-ALERT SE distress alarm will continue to operate normally, going into pre-alarm after 20 seconds with no motion and full alarm after 8-10 more seconds of no motion.

While in low battery condition, the PAK-ALERT SE distress alarm will continue to operate for a period of time greater than the longest duration cylinder available for the respirator. However, the batteries must be replaced before the respirator is used again. See "Battery Replacement" in the Maintenance section of these instructions.

BATTERY TEST:

When the PAK-ALERT SE distress alarm is in the off condition (cylinder valve closed with no flashing green LED on the control console), the batteries can be checked by depressing and holding the reset button on the console.

A green LED will illuminate on the console to indicate sufficient battery power remaining; a red light indicates that the batteries must be replaced before the respirator is to be used again.

WARNING

FAILURE TO REPLACE THE BATTERIES AND/OR CONTINUING WITH MULTIPLE USES OF THE RESPIRATOR AFTER THE LOW BATTERY CONDITION HAS BEEN INDICATED BY THE PAK-ALERT SE DISTRESS ALARM MAY RESULT IN FAILURE OF THE PAK-ALERT SE DISTRESS ALARM DURING USE AND POSSIBLE INJURY OR DEATH OF THE USER.

INTRINSICALLY SAFE LISTING:

The PAK-ALERT SE distress alarm, when installed on a Scott respirator, is Listed as intrinsically safe in Class I Division 1 Groups A, B, C and D hazardous locations by ETL Testing Laboratories.

To maintain Intrinsic Safe Listing, the respirator with PAK-ALERT SE distress alarm must be inspected regularly per the following Regular Operational Inspection procedures, PAK-ALERT SE distress alarm components must not be tampered with in any manner, only batteries of the type indicated on the sensor module label and in the Battery Replacement instructions may be installed. The battery compartment must only be opened in an area known to be free of flammable or explosive hazards.

REGULAR OPERATIONAL INSPECTION:

When installed on a Scott SCBA, inspection and test of the Scott PAK-ALERT SE distress alarm is to be conducted along with inspection and test of the respirator before each use. To do this, the REGULAR OPERATIONAL INSPECTION procedures in your respirator instructions will require modification. The instructions below are to be added to the instructions for REGULAR OPERATIONAL INSPECTION of your respirator. If, during the inspection any malfunction of the respirator or the PAK-ALERT SE distress alarm is noted remove the respirator from service and tag for repair by authorized personnel.

1. While performing the visual inspection of the respirator:

Visually inspect all PAK-ALERT SE distress alarm enclosures, lenses, and wire conduits for cracks, wear or other damage. If damage is noted, remove respirator from service and tag respirator for repair by qualified personnel.

2. Before pressurizing the respirator by opening the cylinder valve:

Check the PAK-ALERT SE distress alarm manual alarm feature by pressing the manual alarm button, located on the front of the control console. The manual alarm shall begin sounding a loud almost continuous 3 tone chirp accompanied by flashing of the red signal light on the control console. Reset the manual alarm by pressing twice on the reset button located on the side of the control console (**fully depress reset button, release and press again**). Unit will sound three chirps and green light will flash. Turn the unit off by pressing the reset button twice again. Unit will sound a two tone chirp and green light will go out.

3. When opening the cylinder valve:

The PAK-ALERT SE distress alarm shall sound 3 quick chirps and the light on the control console shall begin flashing green about once a second. The 3 chirps will sound approximately the same time the Vibraert in the mask mounted regulator actuates briefly.

4. Check pre-alarm:

With respirator pressurized but with air flow stopped (with switch depressed on "donning switch" or "E-Z FLO" regulators or with facepiece held to face on standard models), leave respirator motionless for 20 seconds. The green flashing light shall be replaced by a red flashing light. An ascending/descending tone will sound increasing in volume.

WARNING

IF THE PAK-ALERT SE DISTRESS ALARM IS USED IN AN AREA OF EXPLOSIVE OR FLAMMABLE HAZARDS, FAILURE TO REGULARLY INSPECT AS INSTRUCTED, FAILURE TO CORRECT DAMAGE BEFORE USE OR THE INSTALLATION OF INCORRECT BATTERIES MAY LEAD TO A FIRE OR EXPLOSION WHICH MAY RESULT IN PERSONAL INJURY OR DEATH.

WARNING

FOLLOW REGULAR OPERATIONAL INSPECTION PROCEDURE EXACTLY. IF THE PAK-ALERT SE DISTRESS ALARM DOES NOT ACTUATE, OR DOES NOT OPERATE AS DESCRIBED OR IF ANY OTHER OPERATIONAL MALFUNCTION IS NOTED, DO NOT USE THE RESPIRATOR.

CAUTION

THE PERFORMANCE PROPERTIES OF THE PAK-ALERT SE DISTRESS ALARM CANNOT BE PROPERLY TESTED IN THE FIELD.

WARNING

IN SEVERAL OF THE INSPECTION PROCEDURES DESCRIBED A FULL ALARM WILL BE OBSERVED. THE FULL ALARM CONDITION INCLUDES AN AUDIBLE TONE THAT CAN EXCEED 95 dBA AT 3 METERS (9.9 FT.). IN ORDER TO PREVENT POSSIBLE HEARING DAMAGE DURING TEST, THE ALARM SHOULD BE RESET IMMEDIATELY ON VERIFICATION THAT IT IS FUNCTIONING PROPERLY. HEARING PROTECTION SHOULD BE WORN IF PROLONGED EXPOSURE TO A FULL ALARM CONDITION IS ANTICIPATED.

NOTE:

IF THIS INSPECTION IS DONE IN DIRECT SUNLIGHT IT MAY BE HELPFUL TO SHADE THE LENS ON THE CONTROL MODULE WITH YOUR HAND TO BE SURE THE GREEN LIGHT IS FLASHING.

5. Check pre-alarm reset:

With respirator pressurized but with air flow stopped (see step 4 above) leave respirator motionless until pre-alarm condition occurs. Within 8 seconds, move the respirator to activate the sensor module. PAK-ALERT SE distress alarm shall reset. The red flashing light shall be replaced by a green flashing light and the ascending/descending tone shall stop.

Continue with regular operational inspection of respirator as directed by respirator instructions or your approved respiratory protection plan procedure. During the inspection the respirator must be moved or turned every 30 seconds or less to prevent the sounding of the full alarm.

After completion of all respirator checks and before turning off cylinder valve:

6. Check manual reset of pre-alarm:

With respirator pressurized but with air flow stopped (see step 4 above) leave respirator motionless until pre-alarm condition occurs. Within 8 seconds press and hold reset button. Three (3) chirps shall sound, then release button. The PAK-ALERT SE distress alarm shall reset to the automatic mode and the flashing red light will be replaced by a flashing green light.

7. Check full alarm:

Again, as in step 6 above, leave respirator motionless until pre-alarm condition occurs. Do not reset. Within 10 seconds a loud, almost continuous 3 tone chirping shall begin, accompanied by the flashing of the red light on the control console.

8. Check alarm re-set:

While in full alarm, fully depress re-set button, release, and depress again. The PAK-ALERT SE distress alarm shall reset to the automatic mode. The loud alarm shall stop and the red flashing light shall be replaced by a green flashing light.

9. Check continuing operation of the PAK-ALERT SE distress alarm:

After finishing all respirator checks involving air flow, turn off cylinder valve (push in and turn clockwise), purge all residual pressure in respirator (open purge valve and wait for air flow to stop, close purge valve). The PAK-ALERT SE distress alarm shall remain active with green light flashing. Do not move respirator, pre-alarm shall occur with 20 seconds. Move respirator slightly, pre-alarm shall reset, green light shall start flashing again.

10. Turn PAK-ALERT SE distress alarm off:

With cylinder valve closed and all residual air purged from respirator (see step 9 above) depress reset button twice (press, release and press again). The green flashing light will go out and a fifteen second beep sequence will be heard from the sensor module as residual air pressure bleeds off. When air has bled completely from system, unit will sound a two tone chirp. The PAK-ALERT SE distress alarm is now in the "OFF" condition.

WARNING

IF THE LOW BATTERY INDICATION (ONE STEADY CHIRP EVERY TWO SECONDS WITH NO FLASHING LIGHTS) OCCURS AT ANY TIME DURING REGULAR OPERATIONAL INSPECTION, DO NOT USE THE RESPIRATOR. CHANGE THE BATTERIES IN THE SENSOR MODULE IMMEDIATELY AND REPEAT THE REGULAR OPERATIONAL TEST OR TAKE THE RESPIRATOR OUT OF SERVICE UNTIL THE BATTERIES ARE CHANGED AND THE REGULAR OPERATIONAL TEST IS SUCCESSFULLY PERFORMED.

CLEANING, MAINTENANCE AND STORAGE

Cleaning, maintenance and storage of a respirator with a PAK-ALERT SE distress alarm shall be done as part of the normal respirator POST USE INSPECTION AND CLEANING, as described in the OPERATING AND MAINTENANCE INSTRUCTIONS supplied with each Scott 2.2, 3.0 and 4.5 respirator. The PAK-ALERT SE distress alarm and respirator to which it is attached must be stored in a clean, dry area with an air temperature that does not drop below freezing.

The exterior of the PAK-ALERT SE distress alarm, may be cleaned while cleaning the exterior of the respirator by wiping with a damp sponge and thoroughly wiping dry. The lens on the front of the control console, shown in Figure 2, should be cleaned after every use to insure maximum light intensity at all times. Do not use solvents for cleaning or attempt to paint or apply decals to the exterior surfaces of the PAK-ALERT SE distress alarm.

If during use, the respirator and/or PAK-ALERT SE distress alarm is suspected of being contaminated by a hazardous substance, the contaminate must be identified and properly removed or the contaminated component(s) must be replaced before next use. Dispose of the contaminate or the contaminated component(s) in accordance with applicable regulatory requirements.

BATTERY REPLACEMENT

1. Close respirator cylinder valve, open regulator purge valve letting out all the trapped air, close regulator purge valve, press the re-set button twice. A fifteen second beep sequence occurs as the residual air bleeds off. Unit will sound a two tone chirp and green light will go out.

NOTE:

ALWAYS BE SURE THAT CYLINDER VALVE IS OFF AND PAK-ALERT SE DISTRESS ALARM IS COMPLETELY INACTIVE BEFORE CHANGING BATTERIES. NEVER REMOVE OR REPLACE BATTERIES WITH SYSTEM PRESSURIZED OR DAMAGE MAY OCCUR TO ELECTRONIC COMPONENTS.

2. When replacing batteries on respirators equipped with Backframe, P/N 804415-01, remove the cylinder and place the respirator in a clean, nonhazardous area with the sensor module facing upward as shown in Figure 3.

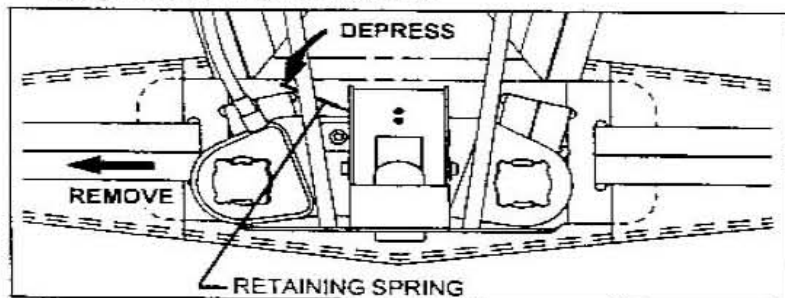


FIGURE 3

3. Depress the PAK-ALERT SE distress alarm retaining spring and slide the Sensor Module from Backframe as shown in Figure 3.

CAUTION

SYSTEM MUST NOT BE PRESSURIZED WHEN BATTERIES ARE INSTALLED. DAMAGE TO THE ELECTRONIC COMPONENTS MAY RESULT IF BATTERIES ARE INSTALLED WITH SYSTEM PRESSURIZED.

4. Turn sensor module over to expose the battery cover, shown in Figure 4 and replace batteries as instructed in paragraphs 5 through 9 of this section.

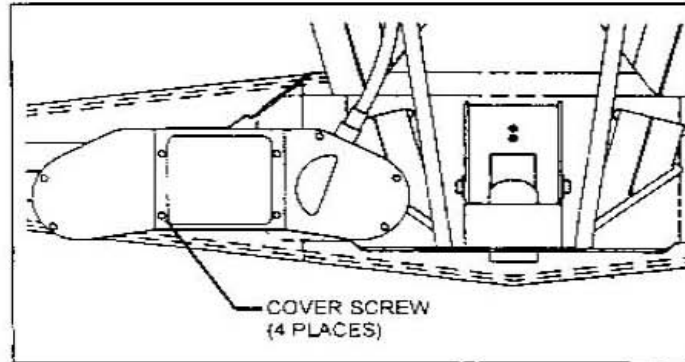


FIGURE 4
BATTERY COVER

5. When replacing batteries on respirators equipped with Harness and Backplate, P/N 804173-01, place respirator in a clean non-hazardous area with the cylinder down exposing the battery cover on the back of the sensor module, as shown in Figure 5.

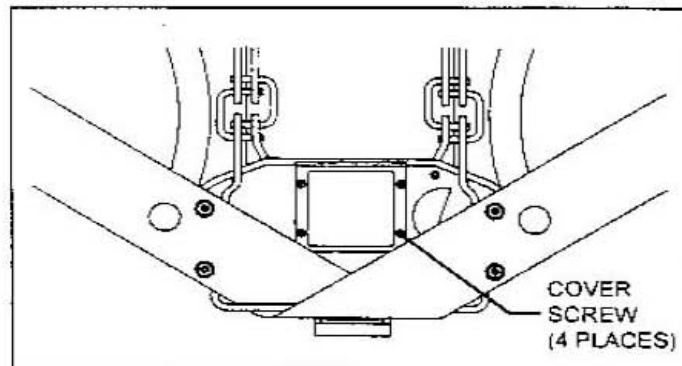


FIGURE 5
BATTERY COVER

6. To remove battery cover, first loosen all 4 cover screws 1 or 2 turns each, then fully loosen the screws so the cover can be removed. Carefully remove cover and set aside.
7. Remove used batteries from battery compartment by lifting edge of batteries at contact end, using a finger or the flat blade of a screw driver, being careful not to damage battery contacts or sealing rib around battery compartment.

8. Install two (2) fresh new batteries. **Always replace both batteries at the same time.** Use only pairs of the following: Eveready Alkaline No. 522 or EN22, Duracell Alkaline No. PC1604 or MN1604, or for increased service life use Ultralife Lithium Battery No. U9VL. Be sure batteries are installed with the terminals positioned as indicated by symbols molded in bottom of battery compartment.
9. The battery cover must be installed so that it is water tight after replacement. Clean the sealing rib around battery compartment and sealing face of the cover, shown in Figure 6, by wiping with a clean damp cloth to remove any dirt or foreign matter which might prevent a proper seal. Check cover gasket for tears or cuts. If damage is found, remove respirator from service and tag for repair by authorized personnel.

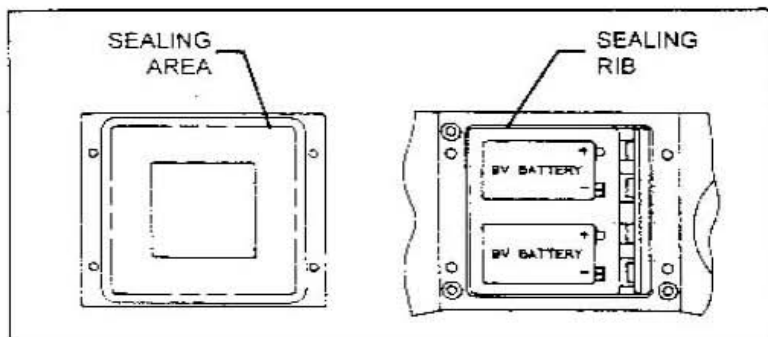


FIGURE 6
BATTERY COMPARTMENT AND COVER SEAL

10. Install battery cover and evenly tighten 4 cover screws by moving around the cover in a clockwise direction, turning each screw 1 or 2 turns at a time until cover is fully seated. If necessary, reinstall the sensor module by sliding in back-pak as shown in Figure 3. **AFTER REPLACEMENT OF BATTERIES, PERFORM A REGULAR OPERATIONAL INSPECTION BEFORE RETURNING RESPIRATOR TO SERVICE.**

Except for the replacement of batteries, no attempt shall be made to do maintenance or to make adjustments or repairs beyond the scope of this instruction manual without proper training.

REPLACEMENT PARTS AND SERVICE

The PAK-ALERT SE distress alarm is covered by a one year warranty.

Consult your Authorized Scott Representative, Distributor or Service Center as to the availability of Service and Parts for the PAK-ALERT SE distress alarm. Replacement 9 Volt Batteries of the type designated are commercially available over the counter, from your Scott Distributor, and from most Industrial Battery Distributors.

WARNING

THE PAK-ALERT SE DISTRESS ALARM IS INTENDED TO ASSIST IN LOCATING A PERSON WHO MAY BE IN A LIFE THREATENING SITUATION. FAILURE TO FOLLOW THE INSTRUCTIONS FOR OPENING, CHANGING THE BATTERIES AND RE-CLOSING THE BATTERY COMPARTMENT MAY RESULT IN DAMAGE WHICH COULD CAUSE FAILURE OF THE PAK DURING A LIFE THREATENING EMERGENCY OR COULD CAUSE A FIRE OR EXPLOSION IN A FLAMMABLE OR EXPLOSIVE ATMOSPHERE POSSIBLY RESULTING IN INJURY OR DEATH.

CHECK YOUR WORK!

BEFORE ASSEMBLY OF BATTERY COVER, CHECK TO SEE BOTH BATTERIES ARE FRESH, NEW BATTERIES OF THE TYPE INDICATED ABOVE AND THAT THEY HAVE BEEN INSTALLED PROPERLY.

Sound Levels:

Pre-Alarm 70 to 105 dBA incrementally at left ear
Full-Alarm 95 to 100 dBA @ 9.9 Ft (3m)
Frequency Range 1.5 KHz to 4 KHz

Battery Life (fresh batteries)

Alkaline Batteries:

In automatic (green flashing light, no sound) Approximately 1000 hours
In full alarm (95 dBA sound and red flashing light) Approximately 8 hours

Lithium Batteries:

In automatic (green flashing light, no sound) > 2,000 hours
In full alarm (95 dBA sound and red flashing light) 8-16 hours

NOTE

DO NOT USE A FIBERGLASS WRAPPED ONE HOUR CYLINDER ON A MODEL 4.5 AIR PAK EQUIPPED WITH A PAK-ALERT SE DISTRESS ALARM AS THE WEIGHT WILL EXCEED THE 35 LBS APPROVAL LIMIT FOR SCBA's ESTABLISHED BY NIOSH.

Compliance

The Scott PAK-ALERT SE distress alarm is a NIOSH approved accessory for use on only the following Scott Air-Paks:

(NIOSH approval numbers have been included for identification):

Scott 2.2 Air-Pak (30 min.)	TC-13F-80
Scott 3.0 Air-Pak (30 min.)	TC-13F-366
Scott 4.5 Air-Pak (30 min.)	TC-13F-76
Scott 4.5 Air-Pak (45 min.)	TC-13F-212
Scott 4.5 Air-Pak (60 min.)	TC-13F-96

Report any operational malfunctions to the certification agency Safety Equipment Institute (SEI), 1307 Dolley Madison Blvd. Suite 3A, McLean, VA 22101, (703) 442-5732, FAX (703) 442-5756.



89387-01 Rev A 3/99

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Printed in USA

QUICK CHARGE ASSEMBLY: An Optional Accessory which allows the recharging of a Scott SCBA Air Cylinder without removing the air cylinder from the breathing apparatus.

QUICK CHARGE ASSEMBLY, P/N 804519-01, for use only with Scott Air-Pak® 2.2 SCBA utilizing 2216 psi Air Cylinders and Facepiece Mounted Regulators with a Donning Switch or an Air Saver Switch.

QUICK CHARGE ASSEMBLY, P/N 804519-02, for use only with Scott Air-Pak® 3.0 SCBA utilizing 3000 psi Air Cylinders and Facepiece Mounted Regulators with a Donning Switch or an Air Saver Switch.

QUICK CHARGE ASSEMBLY, P/N 804519-03, for use only with Scott Air-Pak 4.5 and Air-Pak Fifty SCBA utilizing 4500 psi Air Cylinders and Facepiece Mounted Regulators with a Donning Switch or an Air Saver Switch.

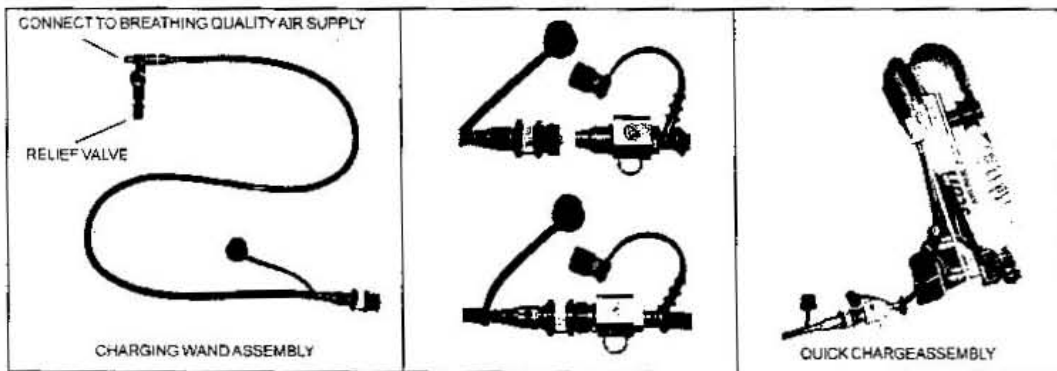


Figure 1
Scott Air-Pak with Integrated Quick Charge Assembly And Remote Charging Wand Assembly

WARNING

THE SCOTT QUICK CHARGE ASSEMBLY AND CHARGING WAND ASSEMBLY IS INTENDED FOR USE WITH SCOTT SELF-CONTAINED BREATHING APPARATUS (SCBA) WHICH MAY SUPPORT HUMAN LIFE IN HAZARDOUS ATMOSPHERES. FAILURE TO CAREFULLY READ AND UNDERSTAND THE FOLLOWING INSTRUCTIONS MAY RESULT IN PERSONAL INJURY OR DEATH TO THE SCBA USER.

THE FOLLOWING INSTRUCTIONS SUPPLEMENT BUT DO NOT REPLACE THE OPERATING AND MAINTENANCE INSTRUCTIONS SUPPLIED WITH EACH RESPIRATOR.

GENERAL DESCRIPTION

The Scott Quick Charge Assembly, P/N 804519-01, and Charging Wand Assembly, P/N 804595-01, are optional accessories for use only with Scott AIR-PAK 2.2 Self-Contained Breathing Apparatus (SCBA) utilizing 2216 psig air cylinders and E-Z FLO® mask mounted regulator or donning switch equipped mask mounted regulator.

The Scott Quick Charge Assembly, P/N 804519-02, and

Charging Wand Assembly, P/N 804595-02, are optional accessories for use only with Scott AIR-PAK 3.0 Self-Contained Breathing Apparatus (SCBA) utilizing 3000 psig air cylinders and E-Z FLO® mask mounted regulator or donning switch equipped mask mounted regulator.

The Scott Quick Charge Assembly, P/N 804519-03, and Charging Wand Assembly, P/N 804595-03, are optional accessories for use only with Scott AIR-PAK 4.5 and Air-Pak FIFTY Self-Contained Breathing Apparatus (SCBA) utiliz-

ing 4500 psig air cylinders and E-Z FLO mask mounted regulator or donning switch equipped mask mounted regulator.

The Quick Charge System provides users with a convenient means of refilling a Scott SCBA cylinder in an atmosphere which is NOT immediately dangerous to life or health (NON-IDLH). The Quick Charge System is intended to allow the cylinder to be charged without removing the cylinder from the respirator. Due to the design of the Quick Charge Assembly, air may added to the AIR-PAK cylinder, but not removed.

WARNING

IT IS NOT POSSIBLE TO TRANSFER AIR FROM ONE SCOTT SCBA TO ANOTHER USING THE SCOTT QUICK CHARGE ASSEMBLY. IT IS THEREFORE NOT POSSIBLE TO USE THE QUICK CHARGE ASSEMBLY AS AN EMERGENCY BREATHING SUPPORT SYSTEM.

To use the Quick Charge System to refill a Scott SCBA air cylinder, the user must provide a source of clean breathing air suitable for SCBA breathing air cylinder charging. This air must contain no less than 19.5 percent oxygen and meet the Grade "D" requirements of the Compressed Gas Association (CGA) Commodity Specification for Air available from the CGA, Inc., 1725 Jefferson Davis Highway, Arlington Virginia, 22202. In addition, the air must be dry, with a dew point of -65° F below zero or lower (25 PPM maximum moisture).

WARNING

FAILURE OF THE USING ORGANIZATION TO SELECT A SUITABLE CHARGING AIR SOURCE AND SUITABLE MEANS OF SAFETY CONNECTION THE CHARGING WAND TO THE AIR SOURCE AS DIRECTED BELOW COULD RESULT IN PERSONAL INJURY OR DEATH.

The user must provide the source of charging air. The source of charging air may be a suitable breathing air compressor, or a compressed air tank or a combination of the two. Only the Scott charging wand assembly may be used to connect the source of charging air to the Quick Charge inlet on the respirator.

The user must provide a means of attaching the source of charging air to the high pressure male 1/4"-18 NPT fitting supplied with the Charging Wand Assembly. The means of attachment may include a length of flexible high pressure hose but must always include suitable high pressure valves or equivalent means of controlling the air flow to the Scott Charging Wand.

The user also must provide suitable high pressure valves or other means of venting (depressurizing) the Charging Wand and any installed flexible hose supplying the charging wand. The flexible supply hose, if installed, and the air controlling and venting valves must be suitably rated for the maximum pressures which could be encountered. The means of attachment must terminate in a high pressure

female 1/4"-18 NPT pipe coupling suitable for attachment to the Scott Charging Wand.

The user must also provide a means of accurately regulating the pressure the charging source delivers to the charging wand assembly to within ± 20 psig of the rated pressure of the cylinder which is being charged. Although the Charging Wand Assembly is equipped with a relief valve which will vent if the rated pressure of the Quick Charge Wand Assembly is exceeded, this relief valve is not intended to, and cannot be used for, venting the supply line.

WARNING

IMPROPER USE OF A RESPIRATOR, INCLUDING IMPROPER CHARGING OF A SCBA AIR CYLINDER, CAN RESULT IN SEVERE PERSONAL INJURY OR DEATH! READ AND UNDERSTAND THE FOLLOWING INSTRUCTIONS AND WARNINGS BEFORE USING OR ALLOWING ANYONE TO USE THE SCOTT QUICK CHARGE ASSEMBLY AND/OR THE CHARGING WAND ASSEMBLY.

WARNING

ALL USE OF A SCOTT SCBA, INCLUDING THE USE OF THE SCOTT QUICK CHARGE ASSEMBLY AND THE CHARGING WAND ASSEMBLY TO FILL SCBA AIR CYLINDERS MUST BE IN CONJUNCTION WITH AN ORGANIZED RESPIRATORY PROTECTION PROGRAM. SEE THE OPERATING AND MAINTENANCE INSTRUCTIONS SUPPLIED WITH YOUR RESPIRATOR FOR ADDITIONAL INFORMATION AND WARNINGS.

There are three different Charging Wand Assemblies. Charging Wand Assembly, P/N 804595-01 is to be used to fill Scott Self Contained Breathing Apparatus equipped with Quick Charge Assembly, P/N 804519-01 utilizing 2216 psig cylinders **ONLY**. Charging Wand Assembly, P/N 804595-02 is to be used to fill Scott Self-Contained Breathing Apparatus equipped with Quick Charge Assembly, P/N 804519-02 utilizing 3000 psig cylinders **ONLY**. Charging Wand Assembly, P/N 804595-03 is to be used to fill Scott Self-Contained Breathing Apparatus equipped with Quick Charge Assembly, P/N 804519-03 utilizing 4500 psig cylinders **ONLY**. The high pressure quick disconnect on the Charging Wand is keyed so that the 3000 psig Charging Wand will connect only to the 3000 psig Quick Charge Assembly and 4500 psig Charging Wand will connect only to the 4500 psig Quick Charge Assembly.

A large amount of energy is required to compress air from the normal atmospheric pressure of approximately "0" psig (pounds per square inch gauge pressure) to 2216 psig, 3000 psig or 4500 psig. Much of this energy remains stored in the compressed air until the pressure is reduced. If the pressure is released suddenly and uncontrollably the energy stored in the compressed air can propel solid objects long distances at very high velocity which can cause damage and personal injury.

5. Remove the dust cap from the Quick Charge coupling and the matching coupling on the Charging Wand. Visually inspect both couplings for dirt or damage. Remove any dirt or contamination from the couplings. If either coupling appears damaged, do not attempt to connect the charging wand to the quick charge assembly. Remove the damaged or contaminated assembly, either respirator or Charging Wand, or both, from service and tag for repair by authorized personnel.
6. Grasp the Quick Charge hose just below the hose coupling and connect to the Charging Wand by pushing the quick disconnect coupling on the Charging Wand against the coupling on the respirator until the quick disconnect sleeve "clicks" into place. Be certain that the respirator cylinder valve is fully open (approximately 2 1/2 turns counterclockwise).
7. Slowly open the charging source valve to pressurize the supply line and begin air flow to the cylinder.
8. The air will stop flowing when the Self-Contained Breathing Apparatus (SCBA) reaches the filling source pressure. The remote pressure unit should indicate "full" at this time. Close the charging source valve and vent the charging line. A check valve in the quick charge assembly will prevent air from flowing out of the SCBA cylinder.

CHARGING TIMES

When the regulated filling pressure is held constant at the cylinder rated pressure throughout the charging cycle the following times apply:

- 30-minute rated, 2216 psig cylinders will take approximately 60 seconds to charge.
- 30-minute rated, 3000 psig cylinders will take approximately 60 seconds to charge.
- 30-minute rated, 4500 psig cylinders will take approximately 35 seconds to charge.
- One-hour rated, 4500 psig cylinders will take approximately 65 seconds to charge.

NOTE

The charging wand assembly relief valve (see figure 1) is designed to vent air if the rated pressure of the cylinder is exceeded. If this occurs, shut off the air from the charging source, vent the charging line and check the pressure at the charging source. The pressure at the charging source must be within 20 psig of the rated cylinder pressure. If the charging source pressure is set too high, reduce the charging pressure and resume charging the respirator cylinder after the relief valve resets. If while charging the cylinder again, the relief valve vents before the charging source has reached the full rated pressure of the cylinder, discontinue the charging procedure, remove the charging wand assembly from service, and tag for repair by authorized personnel.

WARNING

IF AT ANY TIME DURING CHARGING AN AIR LEAK IS DETECTED OR SUSPECTED, SHUT OFF THE CHARGING SOURCE AND VENT THE CHARGING LINE. VENTING THE CHARGING LINE DOES NOT VENT THE CYLINDER. DO NOT APPROACH THE RESPIRATOR UNTIL THE AIR LEAK CAN NO LONGER BE DETECTED; THEN, TURN THE RESPIRATOR CYLINDER VALVE OFF AND DISCONNECT THE RESPIRATOR FROM THE CHARGING WAND ASSEMBLY. DO NOT USE THE RESPIRATOR. REMOVE THE RESPIRATOR FROM SERVICE AND TAG FOR REPAIR BY AUTHORIZED PERSONNEL.

9. When charging is complete, close the respirator cylinder valve and disconnect the Quick Charge Assembly from the Charging Wand Assembly. To disconnect Charging Wand, grasp the charging wand hose near the quick disconnect coupling and slide the coupling sleeve away from the respirator with your thumb and forefinger until the coupling disengages. Install the dust cap on the Quick Charge coupling and the Charging Wand coupling.
10. Charging the cylinder will increase the temperature of the air within the cylinder. When charging is complete and the cylinder is allowed to cool to ambient temperature the pressure within the cylinder will fall slightly. Scott recommends briefly charging (topping-off) the cylinder by repeating steps 4 through 9 above. Only cylinders which are completely full at room temperature are considered to be "fully charged" for the purposes of NIOSH certification.

NOTE

IF CHARGING IN COLD AMBIENT CONDITIONS, I.E. TEMPERATURES BELOW FREEZING, SEE THE SECTION **CHARGING IN COLD WEATHER** IN THIS INSTRUCTION

WARNING

THE DURATION OF THE RESPIRATOR DURING USE DEPENDS, IN PART, ON THE AMOUNT OF AIR IN THE CYLINDER AT THE START OF USE. THE USE OF CYLINDERS WHICH ARE NOT "FULLY CHARGED" WILL SHORTEN THE DURATION OF USE OF THE RESPIRATOR. SEE RESPIRATOR OPERATING AND MAINTENANCE INSTRUCTIONS.

11. After charging is complete, perform the "STANDBY INSPECTION, CLEANING AND STORAGE" procedure in accordance with the OPERATING AND MAINTENANCE INSTRUCTIONS supplied with your Scott respirator or the post use procedure prescribed by your Organized Respiratory Protection Program.

EMERGENCY CHARGING PROCEDURE

Although it is possible to add air to a Scott SCBA that is equipped with a Quick Charge Assembly while the SCBA is being worn, Scott recommends that a cylinder be placed in a container or in a location which is designed to restrain fragments in the event of a problem or a component failure during charging (See step 4 in the Recommended Charging Procedure section of this instruction). Adding air to a Scott SCBA while the SCBA is being worn will result in the wearer of the respirator being in close proximity to the components of the Charging Wand, the Quick Charge Assembly and the Cylinder and Valve Assembly when these components are pressurized with high pressure air. Therefore this procedure should only be used when the circumstances justify exposing the respirator user to the added risk associated with handling additional high pressure components in close proximity to his or her person.

WARNING

NEVER USE THE SCOTT QUICKFILL ASSEMBLY TO CHARGE AN SCBA AIR CYLINDER WHILE THE SCBA IS BEING WORN UNLESS THERE IS A COMPELLING REASON TO ASSUME THE RISK OF INJURY IF THERE IS A COMPONENT FAILURE DURING THE FILL PROCESS.

NEVER USE THE SCOTT QUICKFILL ASSEMBLY TO CHARGE AN SCBA AIR CYLINDER WHILE THE SCBA IS BEING WORN IN AN ATMOSPHERE WHICH IS IDLH—THAT IS, AN ATMOSPHERE WHERE THE RESPIRATOR IS REQUIRED TO SUPPORT LIFE.

NEVER USE THE SCOTT QUICKFILL ASSEMBLY TO CHARGE AN SCBA AIR CYLINDER WHILE THE SCBA IS BEING WORN IF THE SCBA OR THE CYLINDER IS KNOWN OR SUSPECTED OF HAVING BEEN DROPPED, EXPOSED TO DIRECT FLAME IMPINGEMENT OR DAMAGED IN ANY WAY.

To carry out the EMERGENCY CHARGING PROCEDURE proceed as instructed in the RECOMMENDED CHARGING PROCEDURE SECTION of this instruction manual except that the respirator is not removed from the user and a second person is required to inspect the cylinder since the person wearing the respirator cannot see the cylinder to inspect it.

If at any time during the charging procedure an air leak is detected or suspected **STOP CHARGING! SHUT OFF THE CHARGING SOURCE, VENT THE CHARGING LINE, REMOVE THE RESPIRATOR AND LEAVE THE AREA.** Do not approach the respirator until the air leak can no longer be detected. Then turn the air cylinder off and disconnect the respirator from the Charging Wand Assembly. Do not use the respirator. Remove the respirator from service and tag for repair by authorized personnel.

CHARGING IN COLD WEATHER

When using a Scott respirator at temperatures below freezing (below 32°F) the instructions in the LOW TEMPERATURE OPERATION section of the Respirator Operation and Maintenance Manual must be followed. When the respirator is equipped with a Quick Charge Assembly the additional precautions below must be taken:

1. Keep the high pressure air inlet of the Quick Charge covered by the dust cap except when actually connecting to a Charging Wand.
2. Keep the high pressure air inlet of the Quick Charge Assembly dry at all times. Water on the inlet may freeze preventing connection to the Charging Wand or preventing removal of the Charging Wand once connected.
3. If the Quick Charge Assembly was used to fill SCBA cylinders in ambient temperatures less than 32°F (0°C) and the respirator is to be stored indoors at warmer temperatures, the pressure in the cylinder **MUST BE CHECKED FOR EXCESS PRESSURE** between one and two hours after the respirator is placed in indoor storage. Excess pressure must be removed from the cylinders as directed by the following.

WARNING

THE U.S. DEPARTMENT OF TRANSPORTATION (DOT) FORBIDS CHARGING COMPOSITE CYLINDERS BEYOND THEIR RATED PRESSURE. THE AIR PRESSURE IN CYLINDERS INCREASES AS THE TEMPERATURE OF THE CYLINDER INCREASES. CYLINDERS FILLED TO "FULL CHARGE" AT TEMPERATURES BELOW FREEZING WILL BE IN AN OVER CHARGE CONDITION WHEN THE CYLINDER WARMS UP TO NORMAL ROOM TEMPERATURES. FOR EXAMPLE, A 4500 PSIG RATED CYLINDER FILLED TO "FULL CHARGE" AT -25°F, THE COLDEST TEMPERATURE FOR WHICH THE SCOTT RESPIRATOR IS CERTIFIED FOR USE, WILL INCREASE IN PRESSURE TO APPROXIMATELY 5000 PSIG AT ROOM TEMPERATURE (APPROXIMATELY 70°F) UNLESS THE PRESSURE IS REMOVED AS THE CYLINDER WARMS.

To inspect cylinders filled at temperatures below 32°F, wait one to two hours after the cylinders have been placed in a heated environment. Observe the cylinder pressure gauge. If the cylinder pressure gauge indicates above "full" (pointer above the yellow "full" band) depress donning switch, open cylinder valve by turning counterclockwise, open purge valve on mask mounted regulator by turning knob 1/2 turn counterclockwise (pointer on knob downward) and release air from the respirator until the pointer of the gauge on the cylinder is in the yellow "full" band. Close purge valve by rotating knob clockwise (pointer on knob upward), then close cylinder valve by pressing in and turning fully clockwise. Reopen purge valve until all air flow stops. Finally, fully close purge valve.

SCOTT®

CLEANING AND MAINTENANCE INSTRUCTIONS FOR AV-2000™ FULL FACEPIECE WITH EXHALATION VALVE

THIS INSTRUCTION SHEET DESCRIBES THE CLEANING, DISASSEMBLY AND ASSEMBLY PROCEDURES FOR THE AV-2000™ FULL FACEPIECE MASK ASSEMBLY WITH EXHALATION VALVE AND ASSOCIATED HEAD HARNESS ASSEMBLY.

THESE INSTRUCTIONS SUPPLEMENT, BUT DO NOT REPLACE, THE OPERATING AND MAINTENANCE INSTRUCTIONS SUPPLIED WITH THE SCOTT RESPIRATOR THAT UTILIZES THE AV-2000™ FULL FACEPIECE WITH EXHALATION VALVE. YOU MUST BE FAMILIAR WITH THE OPERATION AND TESTING OF THE SCOTT RESPIRATOR THAT USES THIS FACEPIECE.

READ AND UNDERSTAND THIS ENTIRE INSTRUCTION SHEET PRIOR TO ATTEMPTING DISASSEMBLY, PARTS REPLACEMENT OR REASSEMBLY OF THE AV-2000™ FULL FACEPIECE WITH EXHALATION VALVE, OR THE ASSOCIATED HEAD HARNESS ASSEMBLY.

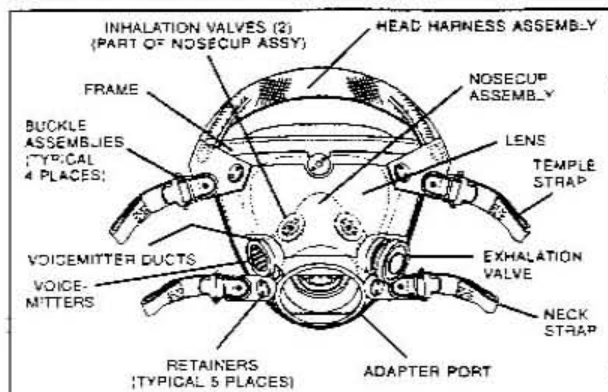


Figure 1 - AV-2000™ MASK ASSEMBLY WITH EXHALATION VALVE

WARNING

THE AV-2000™ FULL FACEPIECE ASSEMBLY WITH EXHALATION VALVE IS INTENDED FOR USE ON RESPIRATORS WHICH MAY SUPPORT HUMAN LIFE IN HAZARDOUS ATMOSPHERES. FAILURE TO READ, UNDERSTAND AND CAREFULLY FOLLOW THESE INSTRUCTIONS WHEN CLEANING, DISASSEMBLING OR REASSEMBLING THE FACEPIECE OR ASSOCIATED HEAD HARNESS ASSEMBLY AND/OR FAILURE TO CHECK YOUR WORK AS INSTRUCTED HEREIN, MAY RESULT IN PERSONAL INJURY OR DEATH OF THE USER OF THE RESPIRATOR.

These Instructions are divided into six Sections

- SECTION 1. Normal Cleaning
- SECTION 2. Removal, Maintenance and Replacement of Nosecup Assembly
- SECTION 3. Removal and Replacement of Exhalation Valve Assembly, Voice-mitter, and Exhalation/Voice-mitter Ducts
- SECTION 4. Removal, Maintenance and Replacement of Head Harness Assembly
- SECTION 5. Removal and Replacement of Lens, Face Seal and Frame
- SECTION 6. Replacement Parts

SECTION 1: Normal Cleaning

Tools Required:

Washing implements (sponge, soft cloth, etc.)

Materials Required:

- 1) Mild soap or detergent
- 2) Disinfectant solution (choice of):
 - a) 70% solution of Isopropyl Alcohol.
OR
 - b) Hypochlorite solution (2-tablespoons Chlorine bleach to 1-gallon water)
OR
 - c) Aqueous solution of Iodine (1-tablespoon tincture of iodine to 1-gallon water)

CAUTION

CERTAIN CLEANING AND DISINFECTING AGENTS SUCH AS QUATERNARY AMMONIUM COMPOUNDS (AMMONIUM CHLORIDES) MAY CAUSE DAMAGE, DETERIORATION OR ACCELERATED AGING TO PARTS OF THE AV-2000 WITH EXHALATION VALVE. USE ONLY THE RECOMMENDED CLEANING AND DISINFECTING AGENTS.

THE LENS OF THE AV-2000 WITH EXHALATION VALVE IS HARD COATED TO RESIST ABRASION, DO NOT USE A VAPOR POLISHER.

DO NOT AUTOCLAVE THE AV-2000 WITH EXHALATION VALVE FACEPIECE.

DO NOT POLISH THE LENS WITH PAPER TOWELS; MOST PAPER TOWELS CONTAIN ABRASIVES.

AVOID ABRASIVE CLEANERS, ACETONE, PAINT AND LACQUER THINNERS, BENZENE, DRY-CLEANING FLUIDS, STRONG PHENOL AND CRESOL SOLUTIONS.

The AV-2000 with exhalation valve is normally cleaned and inspected after each use. Clean the mask assembly as follows:

1. Carefully inspect facepiece and head harness for aging rubber parts, and worn, damaged, missing or loose components. If defective or missing components are found, either replace them in accordance with the appropriate section(s) of this Instruction Sheet, or remove the facepiece from service and tag for repair.
2. Separate the facepiece (with attached head harness) from other respirator components. See the Operation and Maintenance Instruction supplied with the Scott respirator.

NOTE:

The nosecup, exhalation valve, inhalation valve, and head harness *do not* require removal during normal cleaning. If removal of these components is desired, see Section 2 of this Instruction Sheet for removal and replacement of the nosecup assembly and inhalation valve, Section 3 for removal and replacement exhalation valve and voice-mitter, and Section 4 for removal and replacement of the head harness assembly.

3. Carefully wash the facepiece assembly with warm (110°F maximum) soap or detergent solution; thoroughly rinse facepiece in clean water.
4. Disinfect facepiece using one of the following methods.
 - a) Sponge facepiece with 70% solution of Ethyl or Isopropyl Alcohol.
 - OR
 - b) Submerge facepiece in a hypochlorite solution.
 - OR
 - c) Submerge facepiece in an aqueous solution of iodine.
5. Thoroughly rinse facepiece in cool water and allow to completely air dry.

Check your work!

Carefully inspect facepiece and head harness for aging rubber parts, and also for worn, damaged, missing or loose components. See Figure 1.

DO NOT USE THE FACEPIECE if components are worn, damaged, missing or loose. Remove the facepiece from service and tag for repair. Part removal and replacement may be accomplished by following the appropriate section of this Instruction Sheet.

SECTION 2: Removal, Maintenance and Replacement of Nosecup Assembly

CAUTION

ALL PROCEDURES IN THIS SECTION ARE INTENDED TO BE CARRIED OUT BY HAND AND WITHOUT THE AID OF TOOLS. TOOLS USED TO PRY OR PULL COMPONENTS MAY DAMAGE THE RUBBER PARTS.

1. Adjust straps of head harness assembly to the full outward position (see Figure 2). To adjust straps, simultaneously lift the buckle release lever (away from harness strap) and pull head harness strap until end of strap is against buckle. Repeat this procedure for all four straps.

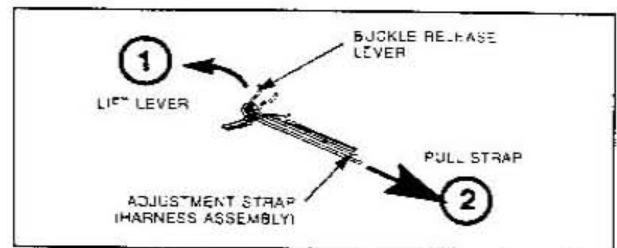


Figure 2 - Strap and Buckle Assembly

2. From outside of the facepiece, using thumbs through the adaptor port, carefully press the rim of the black plastic blocking valve retaining ring and remove it from the nosecup (see Figure 3).

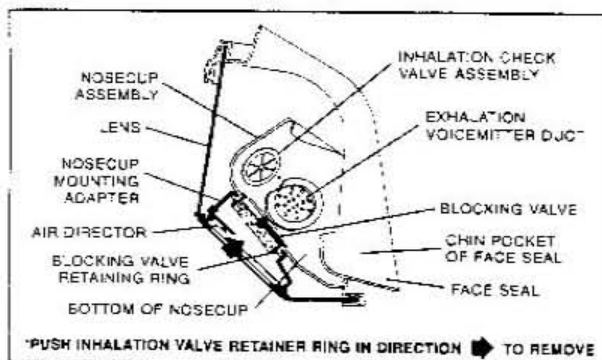


Figure 3 - Facepiece / Nosecup

3. If blocking valve disc replacement is required, grip blocking valve disc with fingers and pull free of valve seat (see Figure 4)
4. To install a new blocking valve disc, moisten stem of valve with a drop of clean water. Slip stem of valve disc into center hole of valve seat as shown in Figure 4. Gently pull stem to seat valve. When valve

is properly installed, the rim portion of the valve will lay flat against the face of blocking valve retaining ring. The reduced diameter of the shaft (closest to valve disc) will be captured in center hole of valve seat. Trim excess from stem, as required (see Figure 4).

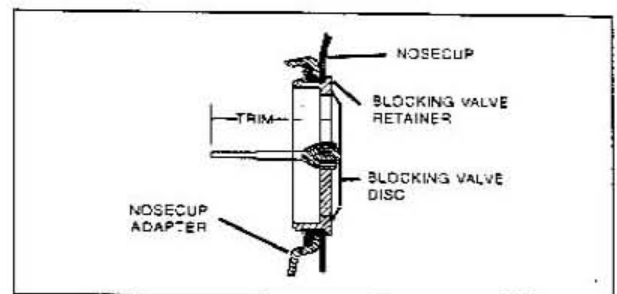


Figure 4 - Blocking Valve Assembly

5. From inside of facepiece, and using fingers only, flex exterior surface of nosecup to separate nosecup assembly from the exhalation/voicemitter ducts. Both ducts will remain attached to the lens.
6. From inside of facepiece and using fingers only, firmly grip nosecup assembly and pull to remove nosecup from facepiece.

7. The two inhalation check valves installed in the valve seats of the nose cup assembly are not normally removed during maintenance. However, if valve replacement is required, grip disc portion of check valve with fingers and pull free of valve seat (see Figure 5).
8. To install a new check valve, moisten stem of valve with a drop of clean water. From inside of nose cup, slip stem of valve into center hole of valve seat as shown in Figure 4. From outside of nose cup, gently pull stem to seat check valve. When check valve is properly installed, the disc position of the valve will lay flat against the spokes of the valve seat, and the reduced diameter of the shaft (closest to valve disc) will be captured in center hole of valve seat. Trim excess stem, as required (see Figure 5).

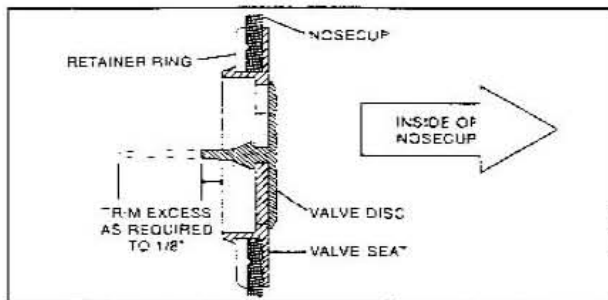


Figure 5 - Inhalation Check Valve

9. The two valve seats are not normally removed for maintenance. However, if a valve seat needs replacement, pry the retainer ring from the outside of the nose cup. Remove the valve seat.
10. Install valve seat in nose cup as follows:

NOTE:

The two piece valve seats may be installed while the nose cup remains in the facepiece. However, it is recommended that the nose cup be removed.

- a) From the inside (face side) of the nose cup, place the valve seat in the mounting hole as in Figure 5.
- b) From the outside of the nose cup, center the valve seat retaining ring over the valve seat and snap together by applying pressure with the thumb and forefinger of both hands, working your way around the valve until all the segments of the valve retaining ring are engaged as shown in Figure 5.
- c) Reinstall rubber valve disc by placing center tab of valve disc into the center hole of the valve seat from inside (face side) of the nose cup and gently pulling into position as shown in Figure 5. Trim excess from valve stem, as required.

To install nose cup in facepiece:

1. Insert nose cup assembly into black nose cup mounting adapter of facepiece assembly. Make sure raised rib in groove of nose cup is positioned in notch of nose cup mounting adapter, and bottom of nose cup is behind chin pocket of face seal. See Figures 3 and 6.

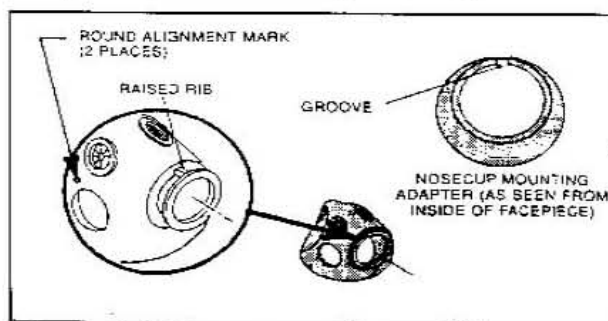


Figure 6 - Nosecup Alignment

2. From inside of facepiece, insert small diameter of blocking valve retainer ring into nose cup as shown in Figure 3. Place fingertips under valve disc, on sealing surface of retaining ring and push retaining ring firmly while observing ring through adapter port to be sure ring is fully seated.

3. From inside of facepiece, stretch each 1-inch diameter hole of nose cup onto end of exhalation/voice emitter ducts until fully seated into groove at end of each duct (see Figure 7).

Check your work!

Inspect all components for damage, tears, rips, holes, or contamination. Replace defective parts.

Check nose cup to verify that inhalation check valves are facing toward the inside of nose cup, and that nose cup is not distorted.

WARNING

USE OF FACEPIECE WITH MISSING OR IMPROPERLY INSTALLED NOSECUP INHALATION VALVES MAY CAUSE THE FORMATION OF A VISION IMPAIRING MIST ON THE INTERIOR SURFACE OF THE LENS WHICH CAN CREATE A DANGEROUS OR LIFE THREATENING CONDITION.

DO NOT USE FACEPIECE UNLESS ENTIRE NOSECUP IS INSIDE FACEPIECE AND NO PORTION OF THE NOSECUP ASSEMBLY EXTENDS BETWEEN THE FACESEAL AND THE USERS FACE.

SCOTT

SCOTT MULTI-WASH MINI GENERAL CLEANER AND DISINFECTANT

FOR USE WITH ALL SCOTT MASK MOUNTED REGULATORS
WITH DONNING OR AIR SAVER SWITCHES
AND AV-2000™ OR SCOTT-O-VISTA® FULL FACEPIECES

WARNING
DO NOT RELY ON THIS PROCEDURE FOR PROTECTION WHEN A KNOWN OR SUSPECTED MEDICAL CONDITION WHICH MAY PRESENT A HAZARD EXISTS. CONSULT YOUR PHYSICIAN OR HEALTH PROFESSIONAL FOR ASSISTANCE.

OVERVIEW

The use of Scott Multi-Wash Mini is a three step process:

1. Thoroughly clean dirt and soil from parts with Scott Multi-Wash Mini or soap and water then thoroughly rinse.
2. Disinfect by completely wetting the surfaces with Scott Multi-Wash Mini. Wait ten minutes.
3. Thoroughly rinse with drinking (potable) water, completely dry and for regulators perform the appropriate regulator check on page 2.

Contact disinfectants such as Scott Multi-Wash Mini are only effective when applied to clean, nonporous surfaces. Scott Multi-Wash Mini must then remain in contact with the surface to be disinfected for at least 10 minutes.

This procedure is to be carried out at room temperature. For respirators stored or used at cold temperature, see Low Temperature Section of this instruction.

Supplies needed:

- Scott Multi-Wash Mini in either 16 oz. or 1 gal. size.
- Drinking (potable) water - running or in a spray bottle.
- Optional: dry, lubricant free air supply of 30 psig or less for drying.

NOTE:

Scott Multi Wash Mini is not considered a hazardous substance for disposal purposes. see MSDS (material safety data sheet) available from Scott or Scott Distributor. Dispose of after expiration date printed on the bottle label has passed. Store in a dry cool place away from direct sunlight. **PROLONGED EXPOSURE TO DIRECT SUNLIGHT MAY REDUCE THE EFFECTIVENESS OF THIS PRODUCT.**

CLEANING AND DISINFECTION PROCEDURE

DANGER
KEEP OUT OF REACH OF CHILDREN.

WARNING
THIS PROCEDURE IS INTENDED TO BE USED ON RESPIRATORS WHICH MAY SUPPORT HUMAN LIFE IN HAZARDOUS ATMOSPHERES. FAILURE TO CAREFULLY FOLLOW THESE INSTRUCTIONS OR FAILURE TO CHECK THE REGULATOR AS INSTRUCTED HEREIN MAY RESULT IN PERSONAL INJURY OR DEATH OF THE USER OF THE RESPIRATOR.

IT IS A VIOLATION OF FEDERAL LAW TO USE THIS PRODUCT IN A MANNER INCONSISTENT WITH THESE INSTRUCTIONS AND ITS LABELING.

PROCEDURE FOR REGULATOR:

1. Remove the breathing regulator from the facepiece by rotating the regulator 1/4 turn clockwise as described in the Operating and Maintenance Instructions supplied with the regulator.
2. Remove any obvious dirt from the external surfaces of the regulator using Scott Multi-Wash Mini with a sponge or soft cloth.

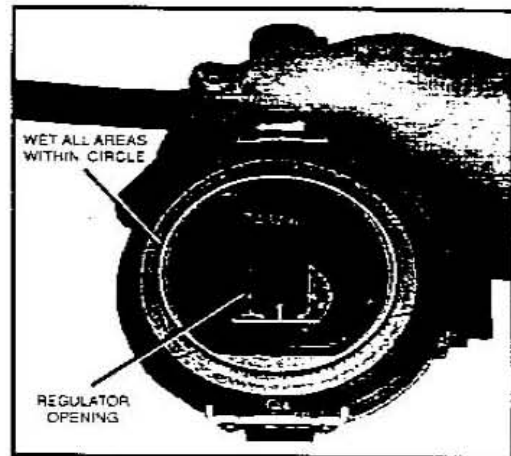


FIGURE 1

3. Inspect the inside of the regulator assembly through the regulator opening (see Figure 1). If dirt or soil is present, forward regulator assembly to Scott trained authorized personnel for thorough cleaning.
4. If clean, depress the donning/air saver switch, close the purge knob by turning fully clockwise and spray a minimum of 6 full pumps of Scott Multi-Wash Mini into the regulator opening. Measure to also wet the immediate area around the opening (see Figure 1). Swirl to completely cover internal components. Turn regulator opening face down and shake excess liquid out. Allow for 10 minutes of contact time to disinfect prior to rinsing.
5. Rinse regulator with drinking water using a spray bottle or soft running water, DO NOT SUBMERGE REGULATOR.
6. Shake excess water out of regulator and then completely air dry before use.

WARNING
FAILURE TO RINSE AND TO COMPLETELY DRY THE REGULATOR ASSEMBLY AFTER DISINFECTION MAY CAUSE DAMAGE TO OR MALFUNCTION OF THE REGULATOR WHICH MAY RESULT IN INJURY OR DEATH TO THE REGULATOR USER

NOTE:

To speed drying of the regulator, gently blow dry with clean dry breathing air of 30 psig maximum. BE CERTAIN THE PRESSURE IS NO MORE THAN 30 PSIG. DO NOT USE SHOP AIR OR ANY OTHER AIR CONTAINING LUBRICANTS OR MOISTURE.

WARNING
THE USE OF AIR AT HIGHER THAN 30 PSIG OR AIR CONTAINING CONTAMINANTS MAY DAMAGE THE REGULATOR WHICH MAY RESULT IN INJURY OR DEATH TO THE REGULATOR USER.

REGULATOR CHECK:

FOR AIRLINE RESPIRATORS:

1. Check to make sure the donning/air saver switch is fully depressed.
2. Check to make sure the purge knob is closed.
3. Reattach the regulator to air supply hose if removed for cleaning.
4. If air flow from the regulator is heard, detach from air supply, repeat steps 1, 2 and 3. If air flow is still heard, tag unit for repair and remove from service.
5. Open the purge valve and observe the air flow from the regulator spray bar. Droplets of water indicate the regulator is not dry. See step 6 on page 1 in PROCEDURE FOR REGULATOR section.

FOR SKA-PAK RESPIRATORS:

1. Check to make sure the donning/air saver switch is fully depressed.
2. Check to make sure the purge knob is closed.
3. Reattach the regulator to air supply hose or to respirator if removed for cleaning. If attached to respirator, slowly open the cylinder valve at least one (1) full turn.
4. If air flow from the regulator is heard, detach from air supply, repeat steps 1, 2 and 3. If air flow is still heard, tag unit for repair and remove from service.
5. Open the purge valve and observe the air flow from the regulator spray bar. Droplets of water indicate the regulator is not dry. See step 6 on page 1 in PROCEDURE FOR REGULATOR section.

FOR SCBA RESPIRATORS:

1. Check to make sure the donning/air saver switch is fully depressed.
2. Check to make sure the purge knob is closed.
3. Reattach the regulator to the respirator if removed for cleaning and check to make sure the respirator cylinder is at least 1/4 full.
4. Slowly open the cylinder valve at least one (1) full turn. If air flow from the regulator is heard, close the cylinder valve, repeat steps 1, 2 and 3. If air flow is still heard, close the cylinder valve fully, tag unit for repair and remove from service.

On regulators equipped with the Vibralert alarm or bell alarm, the alarm will actuate immediately after the cylinder valve is turned on, if the alarm does not actuate, tag unit for repair and remove from service.

WARNING

IF THE VIBRALERT OR BELL ALARM FAILS TO ACTUATE OR DOES NOT STOP AFTER A BRIEF INTERVAL, DO NOT USE THE RESPIRATOR. REMOVE IT FROM SERVICE AND TAG FOR REPAIR BY AUTHORIZED PERSONNEL.

NOTE:

If the pressure in the cylinder is at approximately 1/4 full, the Vibralert or bell alarm may continue to operate throughout this procedure.

5. Open the purge valve and observe the air flow from the regulator spray bar. Droplets of water indicate the regulator is not dry. See step 6 on page 1 in PROCEDURE FOR REGULATOR section.

NOTE:

This regulator check is not intended to be a complete functional check of the respirator. USERS SHOULD PERFORM A **REGULAR OPERATION INSPECTION** contained in the operation and maintenance instructions supplied with each respirator **BEFORE NEXT USE**.

PROCEDURE FOR FACEPIECE:

1. With the regulator removed, carefully wash the facepiece assembly with Scott Multi-Wash Mini and thoroughly rinse in clean water. Note: The nosecup is designed to be an integral part of the facepiece and does not need to be disassembled for cleaning and disinfecting. If the facepiece is heavily soiled, it may be necessary to first wash facepiece with warm (110° F maximum) soap or detergent solution.
2. Disinfect the facepiece by spraying 3 full pumps of Scott Multi-Wash Mini on the regulator side of mask and 3 full pumps on the face side of the mask, wetting entire mask including all rubber and plastic areas. Allow a 10 minute contact time to disinfect prior to rinsing.

NOTE:

The Kevlar[®] and nylon head harnesses are made of porous material. Scott Multi-Wash Mini may not be effective on porous material.

3. Rinse with drinking water using a spray bottle running water.
4. Shake excess water off of facepiece and then dry 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.

USE AT LOW TEMPERATURE:

Respirators intended for routine use and respirators not routinely used but kept for emergency use shall be located in areas where the temperature is maintained above freezing (32°F). Because the disinfecting procedure involves the use of liquids, respirators stored or used at cold temperature must be warmed before cleaning and disinfecting. Respirators being used at cold temperatures after cleaning and disinfecting must be completely dry. See section 5 of REGULATOR CHECK.

If, after carrying out the above cleaning and disinfection procedure, this respirator is unavoidably kept at a temperature at or below freezing before next use, special care **MUST** be exercised to be certain that all components of the respirator are **THOROUGHLY DRIED**.

WARNING

USE OF THIS RESPIRATOR AT TEMPERATURES AT OR BELOW FREEZING (32°F) WITHOUT FOLLOWING THE LOW TEMPERATURE OPERATION INSTRUCTIONS ABOVE AND THOSE PROVIDED IN THE OPERATING AND MAINTENANCE INSTRUCTIONS PROVIDED WITH EACH RESPIRATOR MAY RESULT IN OBSCURED VISION AND/OR PARTIAL OR COMPLETE BLOCKAGE OF THE AIRFLOW.



B9346-01 Rev. A 10/97

SCOTT[®]

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Printed in USA

Appendix C-9:
Personnel 16
Line of Duty Death
Life Threatening Injury
and Funeral Policy

S.O.P. #: PERSONNEL 16

SUBJECT: LINE-OF-DUTY DEATH/LIFE-THREATENING INJURY AND FUNERAL POLICY

DIVISION: ALL PERSONNEL, CAREER OR VOLUNTEER

Objective: In the line-of-duty, a life-threatening injury or death to a member (career or volunteer) is traumatic for any fire department. Many details and arrangements must be made expeditiously. If an incident should occur, this policy establishes the necessary guidelines to assist the Baltimore County Fire Department in managing such a tragedy.

Section 1: Definitions

- A. LINE-OF-DUTY DEATH: The death of any Baltimore County Fire Department member while on-duty, or death while undergoing medical treatment for any injury or disease resulting from such duty. Also recognized as a line-of-duty death, is the critical injury or death of a Fire Department member while traveling in connection with such duty, while engaged in firefighting or EMS activities off duty, or while performing any other department sanctioned activities.
- B. NEXT OF KIN: Immediate family members of the victim including spouse, children, parents, siblings, fiancée, and/or significant others.
- C. LIFE-THREATENING INJURY: Any serious or critical injury in which the prognosis of survival is poor.
- D. INCIDENT: Any scene of a fire suppression or EMS activity, special tactical operation, Departmental vehicle accident, as well as any situation while on duty whereby death has occurred without a specific cause or a life-threatening injury has led or may lead to the death of an Emergency Service Provider.

Section 2: Initial On-Scene Actions Resulting From a Line-of-Duty, Life-Threatening Injury

- A. In any incident where a life-threatening injury has occurred, certain actions are taken once the immediate hazards have been stabilized. The following actions are the responsibility of the on-scene Incident Commander, usually a person with the rank of Captain or higher.
 - 1. Via the Administrative Duty Officer at Fire Dispatch, notify the Fire Chief, Assistant Chief, all Division Chiefs, Company Commander, Public Information Officer (PIO), Health and Safety Officer, Chaplain Coordinator, Fire Investigation Division (FID), President of the International Association of Firefighters (IAFF) Local 1311, and the President of the Baltimore County Volunteer Firemen's Association. Radio transmissions should be kept at an absolute minimum. All specifics are relayed by telephone. The Fire Chief notifies the County Executive and other County Officials.
 - 2. Immediately secure the scene where the incident occurred and impound any personal protective equipment worn or used by the victim. When the victim is removed from the scene for medical treatment or due to impending danger, it is imperative for the rescue personnel to make a mental note of exactly where and in which position they found the victim's body. Accurate preservation of the scene, as close as possible to the original condition when the incident occurred, is vital to the upcoming investigation. Personnel from the Department's Fire Investigation Division and the Baltimore County Police would provide valuable assistance in maintaining scene security.

3. As soon as possible, assign a relief crew to replace the initial personnel directly involved in the incident. These individuals shall be transported by EMS personnel to a secure location, preferably to the nearest Fire Station. Fire Dispatch notifies the Critical Incident Stress Team (CIST) and a Fire Department Chaplain to respond to this location, to provide critical incident stress debriefing, comfort, support, and other necessary assistance if requested by the Incident Commander.
 4. Initiate an immediate on-the-scene investigation at a fire suppression incident with assistance from the Fire Investigation Division; and for any incident involving a departmental vehicle accident, assistance from the Baltimore County Police Department's Accident Investigation Team and/or the Maryland State Police Crash Team. Any incident not directly associated with either situation is to be directed by the appropriate Deputy Chief.
- B. When the victim is transported to a hospital, an EMS District Officer is sent to the receiving hospital and immediately establishes a liaison with the hospital staff, Incident Commander, Public Information Officer, and the Executive Staff of the Fire Department.
- C. The Public Information Officer shall establish an assembly area for all on-scene media personnel. The PIO deciphers all information that can be released immediately, maintaining the confidentiality of information related to the victim until the next of kin is notified.

Section 3: Notification of Next of Kin of a Line-of-Duty, Life-Threatening Injury

- A. Prompt notification of the next of kin is of the utmost importance in the case of any injury. The official notification is to assure the next of kin the validity of the information, as well as to provide a knowledgeable source of information and events concerning the injury.
- B. The Fire Chief is responsible for the initial notification of the next of kin. The notification should be made in person by the Fire Chief, or a designee, and another Fire Department official designated to serve as the Notification Officer. If the incident involves a Volunteer, the President or a member of the Executive Staff of the B.C.V.F.A. shall be part of the notification team.

The Notification Officer attends to the immediate needs and requests of the next of kin. Additional responsibilities include providing immediate transportation to the hospital for family members and notifying the Department's Public Information Officer when it is permissible to release information regarding the victim to the news media.

Section 4: Assisting Immediate Family of a Member with a Life-Threatening Injury

- A. Whenever the family has to go to the hospital to be with an injured family member, high ranking Fire Department Officials are to join the the family to emphasize the agency's support. The initial EMS District Officer who was sent to the receiving hospital by the Incident Commander assumes the role of "Hospital Liaison Officer." If a Volunteer, the President or a member of the Executive Staff of the B.C.V.F.A. shall join the family.
1. The responsibilities of the Hospital Liaison Officer includes coordinating the arrival of the immediate family, fire department personnel, and the media; arranging for waiting facilities for the family; arranging for a press staging area; ensuring that hospital personnel provide continual medical information on the injured employee; assisting family members in gaining access to the injured family member; arranging the family's transportation from the hospital. In the event of death, the Hospital Liaison ensures that the family understands that an autopsy shall be performed to determine the exact cause of death, which includes a toxicologic examination with a test for specific levels of

carbon monoxide (CO), expressed in exact percent. This medical evaluation is necessary for submitting insurance claims and other survivor's benefits.

2. If the family is objecting to autopsy because of religious reasons, the Hospital Liaison shall confer with the family clergy to obtain dispensation or appropriate waiver.

Section 5: Initial On-Scene Actions Resulting from a Line-of-Duty Death

- A. In any incident where a line-of-duty death has occurred, certain actions are taken once the immediate hazards have been stabilized. The following actions are the responsibility of the on-scene Incident Commander, usually a person with the rank of Captain or higher.

1. Contact the Administrative Duty Officer at Fire Dispatch, who will notify the Fire Chief, Assistant Chief, all Division Chiefs, Company Commander, Public Information Officer (PIO), Health and Safety Officer, Chaplain Coordinator, Fire Investigation Division (FID), President of the International Association of Firefighters (IAFF) Local 1311, and the President of the Baltimore County Volunteer Firemen's Association. Radio transmissions should be kept at an absolute minimum. All specifics are relayed by telephone. The Fire Chief notifies the County Executive and other County Officials.

The Administrative Duty Officer shall complete the Notification of Death form for uniformed personnel.

2. Immediately secure the scene where the incident occurred and impound any personal protective equipment worn or used by the victim. If the victim is removed from the scene due to impending danger, it is imperative for the rescue personnel to make a mental note of exactly where and in which position they found the victim's body. Accurate preservation of the scene, as close as possible to the original condition when the incident occurred, is vital to the upcoming investigation. Personnel from the Department's Fire Investigation Division and the Baltimore County Police would provide valuable assistance in maintaining scene security.
3. As soon as possible, assign a relief crew to replace the initial personnel directly involved in the incident. These individuals shall be removed from the incident by EMS personnel to a secure location, preferably to the nearest Fire Station. Fire Dispatch notifies the Critical Incident Stress Team (CIST) and a Fire Department Chaplain to respond to this location, to provide critical incident stress debriefing, comfort, support, and other necessary assistance if requested by the Incident Commander.
4. Initiate an immediate on-the-scene investigation at a fire suppression incident with assistance from the Fire Investigation Division; and for any incident involving a departmental vehicle accident, assistance from the Baltimore County Police Department's Accident Investigation Team and/or the Maryland State Police Crash Team. Any incident not directly associated with either situation is to be directed by the appropriate Deputy Chief.

- B. Line-of-Duty Death may occur in several ways, such as:

- Death at the scene
- Dead on arrival at the hospital
- Alive on arrival, but later expires
- Injuries or distress not detected initially and the member later dies, possibly at home or fire station

1. If death should occur as a result of injuries sustained at a fire suppression incident, the Fire Investigation Division will handle all necessary arrangements with the medical examiner and the Police Department.

2. If death should occur as a result of injuries sustained from an incident other than fire suppression related, the Survivor Action Officer (Division Chief appointed by the Fire Chief as defined in Section 7.A. of this S.O.P.) shall handle, with the approval of the decedent's family, the necessary arrangements with the medical examiner and the Police Department.
3. In all cases, it is imperative to determine the exact cause of death. The remains of the deceased should be turned over to the medical examiner for an autopsy as defined in the post mortem protocol for fire victims, as well as a toxicologic examination with a test for specific levels of carbon monoxide (Co) in the blood, expressed in exact percent. The Public Safety Officer Benefits program requires certain tests to be reported by the medical examiner for submission of claims. The results of the autopsy should be incorporated into the investigation report.

Section 6: Notification of the Next of Kin of a Member Killed in the Line-of-Duty

- A. Prompt notification of the next of kin is of the utmost importance in the case of a line-of-duty death. The official notification is to assure the next of kin the validity of the information, as well as to provide a knowledgeable source of information and events concerning the death.
- B. The Fire Chief is responsible for the initial notification of the next-of-kin. The notification should be made in person by the Fire Chief, or a designee, and another Fire Department official designated to serve as the Notification Officer. At the time of notification, a friend of the family, the Fire Department Chaplain, and EMS personnel should also be present to help to console the next of kin with the immediate emotional trauma. If the incident involves a Volunteer, the President or a member of the Executive Staff of the B.C.V.F.A. shall be part of the notification team.

The Notification Officer attends to the immediate needs and requests of the next of kin. In addition, the Notification Officer should remain with the next of kin until the arrival of family members, or as long as requested. Additional responsibilities include providing transportation for family members, if necessary, and notifying the Department's Public Information Officer when it is permissible to release information regarding the victim to the news media.

- C. Once all notifications have been completed (including family), the following announcement by Fire Dispatch will be made at 1000 hours and 1900 hours, each day, until the designated hour of the funeral.
 1. "It is with great sorrow that we announce the death of;
 - rank, full namein the performance of his/her duties to serve the citizens of Baltimore County. Funeral services are scheduled for;"
 - date
 - time
 - location

Section 7: Assisting Immediate Family of a Member Killed in the Line-of-Duty

A. Survivor Action Officer

1. The Fire Chief designates an active member to serve as the Survivor Action Officer. Serving as the direct representative of the Fire Chief, this officer receives the full cooperation of the entire Fire Department.
2. The primary functions of the Survivor Action Officer is to serve as a facilitator between the next of kin and the Fire Department; therefore, attending to the continuing needs of the immediate family. The Survivor Action Officer also coordinates the activities of the Survivor Action Committee.

B. Survivor Action Committee

1. The Survivor Action Committee consists of a number of personnel assigned to handle specific aspects of the funeral arrangements and to assist the immediate family whenever necessary. These assignments shall be made by the Survivor Action Officer, with approval of the Fire Chief, and includes the following:
 - a. Family Liaison Officer: This assignment is delegated to a member of the Fire Department that is a close friend of the decedent's family. Responsibilities include providing a 24-hour logistical contact for the family; transportation for the family; and maintains constant communication with the Survivor Action Officer.
 - b. Funeral Officer: Assignment that is delegated to the Department's Honor Guard. The Honor Guard Commander helps the family facilitate the funeral arrangements by interacting with the Funeral Director; with the clergy of the church for funeral service selected by the family, and with the agency responsible for the cemetery; activities of pallbearers, honorary pallbearers and ushers; responsible for arranging and directing the funeral procession; and maintains a liaison with the Baltimore County Police Department for traffic control.
 - c. Procession Officers: Assignment delegated to the District Battalion Chief and the Station Captain where the deceased was assigned, to assist the Funeral Officer.
 - d. Support Services Officer: Supplies additional resources as required.
 - e. B.C.V.F.A. Executive Officer: Coordinates all activities with the station of the deceased Volunteer member, and maintains a liaison with the Survivor Action Officer and the appointed committee.
 - f. Police Department Liaison: Officer assigned to the team by the Police Department to assist in traffic control.
 - g. Public Information Officer: The PIO is the primary contact for any inquiries received by the Department regarding the incident.
 - h. Benefits Coordinator: The Department's Safety Office ensures that all the documentation regarding the employee's death and any benefits claims entitled to the surviving family are completed and sent to organizations responsible to provide payments.
- C. It is imperative for the Survivor Action Committee to convene as soon as possible after the line-of-duty death to begin making the necessary arrangements. (However, the level of Fire Department participation with the funeral arrangements is at the discretion of the surviving family.)

Section 8: Incident Investigation Resulting From a Line-of-Duty, Life-Threatening Injury or Death

A. Appointing the Investigation Team

1. The investigation of a line-of-duty injury or death is one of the most difficult and most important activities that must be conducted by the fire department. This difficulty is compounded by the fact that the investigation is conducted under extremely stressful circumstances and often under pressure for the rapid release of information. Therefore, immediately after an incident has occurred, the Fire Chief assigns an Investigation Team to conduct an inquiry of the circumstances associated with the event. The team's objective is to thoroughly analyze and document all the events leading to the injury or death and to make recommendations aimed at preventing similar occurrences in the future.

B. Investigation Team Composition

1. A thorough investigation of the injury or death requires five or more team members. These members include a Division Chief, the Department's Health and Safety Officer, a member from the Fire Investigation Division, an IAFF Local 1311 union representative, and the B.C.V.F.A. Vice President of Operations or designee when a Volunteer is involved. Other team members are selected according to their expertise associated with the circumstances involved in the incident. For example, a traffic accident involving fire apparatus requires an individual who is qualified to investigate vehicle accidents, such as a police officer. Therefore, the additional team members are selected according to their specific qualifications.

C. Team Leader

1. This responsibility is delegated to a Fire Department Division Chief who has the authority to manage the investigative process. The Team Leader coordinates the activities of the investigation and provides periodic updates to the Fire Chief.

D. Objectives and Responsibilities of the Investigation Team

1. The primary objective is to determine the direct and indirect causal factors that resulted in the injury or death and to recommend actions that would prevent or reduce the risk of a similar event. A secondary objective is to obtain, document and secure evidence which may be a factor in a regulatory actions or litigations resulting from the incident.
2. Additional responsibilities include gathering and analyzing all physical evidence relating to the incident; written interview summaries of all witnesses that may have knowledge of the circumstances; documentation of radio communications, telephone conversations, photographs, film, videotape and related information; conferring with persons having special knowledge of the factors involved in the incident, including experts and consultants from the private sector; and liaison with other agencies involved in the investigation.
3. The Investigation Team cooperates with all other governmental agencies that have a legal cause to be involved in the investigation, such as the Maryland Occupational Safety and Health (MOSH), United States Fire Administration, National Institute for Occupational Safety and Health (NIOSH), Law Enforcement Agencies (i.e., FBI and/or ATF), and the State Fire Marshal. With the approval of the Fire Chief and at the agency's discretion, their level of participation in the investigation, if any, is dictated by the circumstances associated with the incident.
4. Other agencies available to the Investigation Team are as follows: the Baltimore County Office of Law, National Fire Protection Association (NFPA), International Association of Firefighters (IAFF), International Association of Fire Chiefs (IAFC), National Transportation Safety Board (NTSB), National Fire Academy, National Volunteer Fire Council (NVFC), Consultants, Testing Laboratories, and American Petroleum Institute.

E. Report Development and Presentation

1. When the team members are satisfied that they fully understand what happened, why it happened, and the steps that need to be taken to prevent a similar occurrence in the future, the investigation can be finalized and all the information organized into a final document. The visible product of an investigation is a written report supported by photographs, illustrations, diagrams, videotapes, audio tapes, and physical evidence, if necessary. The written report and any visual aids needed to fully

illustrate the facts of the incident will be presented to the Fire Chief by the Investigation Team. The Fire Chief shall determine the schedule and method for the public presentation of this report.

Section 9: Cooperating With Other Agencies

- A. A line of duty life-threatening injury or death shall require a high level of cooperation between the Fire Department's Investigation Team and other agencies and organizations that will be involved in investigating or seeking information on the incident. This may include organizations that are requested by the Fire

Department and others that have legitimate reasons to be involved. The best policy is to be cooperative with all agencies that have a recognized reason for being involved in the investigation.

A fire cause investigation may be carried out in parallel with the safety investigation and, if there is evidence of arson or other criminal acts, the situation will become much more complicated. The investigation of safety factors must continue, while a high level of coordination is provided with fire investigation and law enforcement investigators.

If the incident is a vehicle accident or a situation where some other agency has primary jurisdiction for the investigation, the Team Leader will have to establish a close liaison with that agency. Most public agencies will recognize the need for the fire department to conduct an investigation and will work cooperatively with the Investigation Team.

B. Medical Examiner

1. The Medical Examiner has the responsibility to determine the cause of death and may send an investigator to the scene. The on-scene investigative responsibility is sometimes delegated to the police agency. These investigators are not experts at investigating fires or fire deaths and will usually be pleased to work with the Fire Department's team to gather their information.
2. It is imperative to determine the exact cause of death. The remains of the deceased should be turned over to the medical examiner for an autopsy as defined in the post mortem protocol for fire victims, as well as a toxicologic examination with a test for specific levels of Carbon Monoxide (CO) in the blood, expressed in exact percent. The Public Safety Officer Benefits program requires certain tests to be reported by the medical examiner for submission of claims. The results of the autopsy should be incorporated into the investigation report.

C. Maryland Occupational Safety and Health (MOSH)

1. The A.D.O. at Fire Dispatch is required to notify the state agency, MOSH, of any line-of-duty death. In most cases this agency will send an investigator to prepare a report on the incident.

D. News Media

1. Media inquiries should be directed to the Fire Department's Public Information Officer or to the Team Leader. While the investigation is in progress, it is appropriate to provide information on how the investigation is being conducted. No findings should be released until the full report is completed and reviewed. Certain information, such as the Medical Examiner's report will be released as public records at the same time they are available to the Investigation Team.
2. In some cases, it will be necessary to interview reporters who covered the incident as witnesses. News photographs and videotape have been valuable in several investigations and most news organizations will provide copies if the department will make an official request with assurance that they will be used only to support the investigation and subsequent training objectives.

E. Critical Incident Team

1. Critical incident stress has been recognized and documented as a significant factor in the fire service. A line-of-duty death is one of the most stressful situations that can occur. All members involved in the incident should be encouraged to go through a critical incident debriefing process and, if necessary, should receive additional support and treatment.
2. It is important not to overlook the Investigation Team in dealing with post traumatic stress. The pressures on the team members are as significant as those on the personnel who were involved in the incident and often must be prolonged-for several days or weeks. In addition to their own stress, the team members are directly exposed to the feelings and reactions of everyone else who may have been affected by the incident.
3. It is generally inappropriate to have the Investigation Team members participate with the other personnel in group processes, as their presence may inhibit others from exposing their inner feelings. The investigators may be seen as an intrusion into the stress management process and may be subject to hostility from some of the participants. It is preferable to provide a separate stress management process for the Investigation Team. The Critical Incident Team should assign a liaison to work with the Investigation Team and arrange for the investigators to receive full support for their stress, both during and after the investigation.

F. NIOSH

1. The National Institute for Occupational Safety and Health (NIOSH) is an agency of the Federal Department of Health and Human Services that is primarily directed toward the development of research data to support occupational safety and health. In this role NIOSH may request permission to investigate incidents that involve topics of particular concern or interest, such as confined space incidents and heat stress deaths. NIOSH is also the agency that tests and certifies respiratory protective equipment and is very interested in situations involving breathing apparatus.

NIOSH has excellent resources and is usually extremely cooperative in assisting the local jurisdiction with an investigation, particularly if it fits the agenda of current research topics.

A NIOSH investigation has no regulatory powers and is not intended to find fault or responsibility. It will identify lessons and examples and it may indicate actions that could or should have been taken to prevent the incident.

G. USFA

1. The United States Fire Administration and the National Fire Academy are both very concerned with fire service health and safety issues. The Fire Administration has requested to be notified immediately of any line-of-duty death and to be sent a copy of all investigation reports. The Fire Administration also serves as a point of contact for the Public Safety Officer Benefits Program.

The Fire Administration contracts with a private sector organization to prepare reports on incidents of particular significance, such as multiple fire fighter deaths at one incident. This report is usually a follow-up to other investigative agencies, gathering and reporting on the information that would be of interest to the fire service and other agencies. The report is for informational purposes only and is always submitted to the local jurisdiction for review and approval before it is released.

If requested by the Fire Department, the Fire Administration has the ability to dispatch the contracted investigator to advise or assist the local jurisdiction in conducting the investigation. The request should be made directly to the USFA Administrator.

H. NFPA

1. The National Fire Protection Association has a continuing interest in fire fighter health and safety, particularly as it relates to the development of NFPA Standards. For many years NFPA has sent investigators to prepare reports on major incidents. These reports are published in NFPA periodicals and presented at NFPA meetings.

The NFPA investigation reports are primarily informational and often describe the relationship between NFPA standards and the incident. NFPA has no enforcement powers and carefully directs its reports at a factual discussion of the incident. If requested by the local jurisdiction, NFPA is usually willing to send an investigator to assist the fire department Investigation Team. NFPA also has a staff of specialists in different areas of fire protection who are available for consultation.

I. NTSB

1. The National Transportation Safety Board (NTSB) is primarily involved in the investigation of accidents involving public transportation systems. The investigation of accidents involving fire apparatus has caused NTSB to take an interest in vehicle design and maintenance, as well as driver training. This agency may be contacted and requested to assist in the investigation of a major vehicle accident.

J. FBI and ATF

1. The Federal Bureau of Investigations and the Bureau of Alcohol, Tobacco and Firearms have excellent resources and are extremely cooperative in assisting local jurisdictions with an investigation.

K. IAFF

1. The International Association of Fire Fighters is extremely active in occupational health and safety and often becomes involved in investigations that involve the death or serious injury of career fire fighters. This has included encouraging state and federal agencies to investigate incidents and engaging independent experts to investigate some situations.

An effective on-going safety program that involves labor and management is an important component of accident prevention. It is also one of the most effective means to avoid conflicts when an accident occurs. A shared labor-management commitment to a health and safety program should support the Fire Department's investigation process.

L. Baltimore County Office of Law.

1. Legal issues will be involved in some aspect of every line-of-duty death investigation. The Law Office should be contact for legal advice in all situations.

Section 10: Death Notification - "Non-Job Connected" (Active or Retired Member)

A. When notice is received of the death of an active or retired member of the department, it is the duty of the member who first received such notice to immediately notify the Administrative Duty Officer at 410-307-2052.

1. The on-duty Administrative Duty Officer, upon such notification, will complete all information required on the Notification of Death form for uniformed personnel.
2. After all contacts have been made as required on this form, the Administrative Duty Officer may, with permission of the family, release the following information to be transmitted via departmental teletype:
 - a. Statement giving full name, rank, and station/duty assignment.
 - b. Date, time, and place of death.
 - c. Location of funeral home and hours of viewing.
 - d. Time and location of service.
 - e. Date and time of funeral, along with name and location of interment.
 - f. Biographical information regarding the member's career, if retired.
 - g. Information regarding uniform of the day, if a fire department funeral is requested.
3. Upon being notified of the death of an active or retired member of the battalion, the on-duty Battalion/Division Chief will ensure that off-duty Battalion/Division Chiefs of the deceased member's battalion are immediately notified.

Section 11: Funeral Arrangements

A. The Honor Guard Commander is charged with the responsibility of coordinating Fire Department activities and is responsible for the following:

1. Coordinate contacting the family of the deceased through the Survivor Action Officer (Section 7.A. of this S.O.P.) in order to explain the services and benefits available to them through the department.
2. Arranging the funeral, when a Fire Department funeral is requested.

3. Coordinating the various elements of a funeral, such as: Honor Guard, funeral home, clergy, transportation, etc.
 4. Becoming personally familiar with the topographical features of the funeral home, route of travel, and place of interment.
 5. Coordination with Police Department and other outside agencies.
 6. Become familiar with deceased member's religion, the type of service, facilities, and weather considerations.
- B. The Honor Guard Commander, or his/her designee, shall be responsible for all verbal commands of the funeral escort.
1. Any member attending the funeral service in uniform shall be considered a member of the escort, and shall be governed by the directions of the Honor Guard Commander.
 2. Members of the escort shall assemble quietly and respectfully in the area designated.
 3. Members shall conduct themselves in such a manner as not to distract from the solemnity of the occasion.
 4. If the Honor Guard has not been requested, the funeral escort shall be commanded by the highest ranking officer in attendance.
- C. Active Member - "Line of Duty Death"
1. A uniformed driver and Fire Department vehicle shall be assigned to the family through the Survivor Action Officer (defined in Section 7.A. of this S.O.P.) for assistance and transportation, if requested.
 2. Full Honor Guard at the casket shall be provided by the Fire Department.
 3. Pallbearers may be provided by the Fire Department, if so requested.
 4. Casket to be carried on the deceased member's most recent duty station engine.
 5. Colors, if requested, shall be provided by the Fire Department at the place of worship and at the place of interment.
 6. Taps will be provided by the Fire Department Honor Guard.
 7. Bag Pipes, if requested, will be provided by the Fire Department Honor Guard.
 8. The last duty station shall be draped in front with black bunting for thirty (30) days from the date of death.
 9. When the funeral procession of the deceased member passes any fire station, members shall assemble in front of the station in uniform, at attention, and shall render a hand salute as the casket passes.

D. Active Member - "Non-Job Connected Death"

1. Full Honor Guard shall be provided at the casket, if requested by the family.
2. Pallbearers may be provided by the Fire Department, if so requested.
3. Colors, if requested, shall be provided by the Fire Department at the place of worship and at the place of interment.
4. If the widow/er requests it, the procession may go past a career fire station, where the station members will assemble in front and in uniform. They will stand at attention, rendering a hand salute as the casket passes.
5. The casket will not be borne on the apparatus.
6. No black bunting will be provided for the duty station.

E. Retired Member

1. If the family cannot provide pallbearers, the Baltimore County Retired Fire Officers and Fire Fighters Association, The Baltimore County Volunteer Firemen's Association, and The Baltimore County Professional Firefighters Association will be contacted, if requested by the family.
2. Colors, if requested, shall be provided by the Fire Department's Honor Guard at the place of worship and at the place of interment.
3. If the widow/er requests it, the procession may go past a career fire station, where the station members will assemble in front and in uniform. They will stand at attention, rendering a hand salute as the casket passes.
4. No other Fire Department procedures shall be provided.

Section 12: Flags

A. Upon the death of an active or retired uniformed member of the Baltimore County Fire Department, the Baltimore County Flag shall be flown at half-staff.

1. Active Member - "Line of Duty Death"
 - a. Baltimore County Flag flown at half-staff day and night, regardless of weather, for a period of thirty (30) days from the date and hour of death.
 - b. United States Flag will cover the casket (obtained by the Honor Guard Commander).

2. Active Member - "Non-Job Connected Death"
 - a. Baltimore County Flag will be flown at half-staff, daylight only, from the notification of death until one (1) hour after the designated time of the funeral.
 - b. The United States Flag may be used as a casket cover only if the member is a veteran of the Armed Forces of the United States, the Coast Guard or Merchant Marines.
3. Retired Member
 - a. Baltimore County Flag will be flown at half-staff, daylight only, from the notification of death until one (1) hour after the designated time of the funeral.
 - b. The United States Flag may be used as a casket cover only if the member is a veteran of the Armed Forces of the United States, the Coast Guard or Merchant Marines.
4. The on-duty Battalion/Division Chief shall ensure that the flag is flown according to the correct procedure.

Appendix D:
International Assoc. of
Fire Chiefs - Firefighter
Safety Call to Action
December 23, 2013



IAFC Member Alert

Contact: IAFC Strategic Services Department
703-273-0911 | www.iafc.org

Firefighter Safety Call to Action: New Research Informs Need for Updated Procedures, Policies

*A joint effort between the International Association of Fire Chiefs
Safety, Health and Survival Section and the International
Society of Fire Service Instructors*

Fairfax, Va., Dec. 23, 2013 - Given the recent proven research by Underwriter Laboratories and the National Institute of Standards and Technology, this call to action is being issued to fire and emergency service officers to take the following immediate actions:

1. Update departmental fireground policies and procedures, deliver training programs and conduct in-service updates to reflect fire dynamic research findings:

- Water doesn't push fire or threaten trapped occupants:
 - Water should be applied to a fire as soon as possible and from the safest location because research has proven it reduces thermal temperatures.
 - Simply put, if you see fire, put water on it immediately. This greatly increases civilian and firefighter survivability as well as property conservation.
- The recently created mnemonic, [S.L.I.C.E.R.S.](#), should replace RECEO VS as a core component of firefighter training programs.
- Coordinate ventilation and fire attack. Ventilation continues to be an important tactic that requires significant coordination and control. Adding air to a building without the immediate application of water on today's fires greatly increases fire spread and reduces survivability for victims and firefighters. It isn't possible to make statements about the effectiveness of ventilation without consideration for the timing and application of water. Venting doesn't always lead to cooling; well-timed and coordinated ventilation leads to improved conditions.
- Control the door, control the flow path. Forcing, or opening, a doorway for entry creates an inflow ventilation flow path. Controlling the door to reduce

airflow is an important step to improve the survivability of victims and firefighters, control heat release rates and reduce the chance of flashover.

- Closing interior doors to improve compartmentalization is critical to victim and firefighter survivability. What used to be referred to as "Vent-Enter-Search (VES)" is now known as "Vent-Enter-Isolate-Search (VEIS)." When conducting VEIS tactics, closing the door to an entered compartment *prior to* conducting search operations is vital to controlling the flow path.
- Assess exterior and interior collapse potential:
 - Structural stability and potential for collapse must be a priority for consideration during size-up and brief initial reports (BIRs) should identify the presence or potential presence of engineered, lightweight building materials.
 - Sounding the floor for stability is not an exclusive reliable indicator of structural stability and therefore should be combined with other tactics to increase safety.
 - Floor sag is a poor pre-indicator of floor collapse as it may be especially difficult to determine the amount of deflection while moving through a structure.
 - Thermal imagers are not an exclusive, reliable indicator of the presence or absence of fire in a basement and can't assess structural integrity above floor coverings.
 - Water application to a fire in a basement should be applied from an exterior access, penetrating nozzle or via holes cut into the compartment. Conducting an attack on a basement fire from the floor above via interior access is not recommended.
- Conducting a 360° size-up of the fire occupancy should be completed prior to making entry. Wind-driven fires represent an immediate life-threat to firefighters, particularly in light of flow-path research. Attacking the fire from the windward side of the structure may be the most effective way to save lives.
- Discourage or eliminate the widely-used term "nothing showing" from the BIR. As a result of modern fuel loads and energy-efficient building-construction materials, fires in structures can be expected to become ventilation-limited quickly. Smoke or open flame may not be visible from the exterior by arriving fire companies and the term unintentionally but significantly contributes to complacency.

2. Call on standards-setting organizations and publishers to update their programs and products immediately to reflect the latest fire-dynamic research findings.

To learn more about the fire-dynamics research, check out the following resources:

- Organizations:
 - [National Institute of Science and Technology](#)
 - [Underwriters Laboratories](#)
 - [International Society of Fire Service Instructors](#)
 - [IAFC Safety, Health and Survival Section](#)
- Watch for It: FSTAR
 - There's a wealth of research underway at leading labs, universities and the private sector on fire behavior in the modern-built environment, but it will have little impact on firefighter tactics unless it reaches fire service leaders. *Firefighter Safety Through Advanced Research (FSTAR)* is a federally-funded online toolkit being created by the IAFC to break down silos between the academic world, laboratory settings and the fireground. Watch for it in the spring of 2014.