

Rule of Air Management - Point of No Return

by Tim Farmer, Coon Rapids Fire Chief

Opportunities to Improve Safety

This year's North Suburban Regional Mutual Aid Association's school dealt with the Rule of Air Management - Point of No Return. The facilitator was Captain Mike Gagliano, Seattle (WA) Fire Department who's core concepts were "The Need, The Mandate, and The Solution" of air management.

The class was excellent, and exactly what I was looking for as we (the Coon Rapids Fire Department) were already working on enhancing our personnel safety with regard to air management. Through the work of Firefighter Jeff Sanders and Fire Inspector Todd Williams, we had secured an Assistance to Firefighters Grant, and evaluated and purchased new high-pressure breathing apparatus. The new Scott Air Paks, which are rated for 45 minutes of use, replaced our 30 minute paks. The whole concept was to increase escape time (firefighter safety), without losing working time or increasing the weight of the units. The new air packs were already in-service, but we did not have a good procedure or written policy dealing with how they were to be operated.

Flashback – Close Call

About 20 years ago, Coon Rapids Firefighters Bob Davidson, the new guy Firefighter Tim Farmer, and Fire Captain Ralph Kays were on the scene of a working fire in a metal plating company. Due to the nature of the business and size of the building, a 2½ inch hoseline was pulled into the building about 150 feet to reach the fire. The nature of what was burning (plastics, rubber and wood) generated very thick and black smoke, and finding our way through the building was slow going. It took some time to reach the fire, but it was quickly extinguished with the 250 gallons per minute stream of water. As we began moving in a little closer a low air alarm began ringing. The captain ordered Bob out of the building, and the two of us began to overhaul the area. Within about three minutes my low air alarm bell sounded, and we turned to leave, but my facepiece was hung up on something.

When Captain Kays realized that I was not leaving with him, he began to shout at me and even pulled me toward the exit, but this only caused my facepiece to lift, and I lost air faster. We began a tug-o-war of sorts, him pulling and me pushing him away, until I was able to show him with my flashlight that I had some sort of problem. I still remember looking through the small lens of my facepiece, into the captain's lens to see his wide-open and scared eyes. His hands were shaking, and my bell was ringing very slowly.

When I was finally loose of the problem, (it was heavy gauge wire which is used to strengthen flexible exhaust tubing caught in the "hook" of the hook and "D" ring flap closure system on my turnout coat) I began moving back toward the exit while straddling the 2½ inch hose which I could just make out on the floor. When my bell quit ringing and the facepiece was sucking up to my face, I dropped to my hands and knees and quickly crawled out of the building.

As I have looked back on this over the years, it has always stuck with me how close I had come to not getting out, even though the fire was out and I was not injured or impaired, other than the wire that held me.

Changing Attitudes

Mike Gagliano did a great job of explaining; how firefighters are dying in structures, factors that affect the duration of a firefighter's air supply, myths of air management, practical ways to manage breathing

air, and the point of no return. He reviewed close calls in Seattle, Phoenix, Ft. Worth and other cities to strengthen his arguments that there is a strong need for a Rule of Air Management.

One of the major challenges to changing is that we, the United States fire service, were trained, and continue to function, using our “reserve” supply of air (1/4 tank of air) for working time, and do not think (as versus immediately react) about exiting until the low air alarm sounds. This is what our textbooks told us, how we have trained and operated, and what we understood as the proper procedures according to the SCBA manufacturers. Mike made the point that we are the only industry that routinely uses our reserve air for operations. He also noted, and cited examples, of firefighters who were in trouble with their air supply running out who were ignored by coworkers – because low air alarms sounding has become routine during emergency operations. He advocates leaving long before the alarm sounds, and to pay attention to alarms to ensure that people get out of the hazard area. This is already being done by hazmat teams to ensure that there is time to get out of the hot zone and through decontamination before the air supply is exhausted.

Basic Concepts

1. Exit before you use your reserve air.
2. A low air alarm indicates the use of the reserve.
3. Low air alarm activation is an “immediate action item.”

Challenges to Implement Changes

Over the past few years a lot of magazine articles, training classes, NFPA standards, websites (www.everyonegoeshome.com, www.respondersafety.com), and conferences have focused on firefighter safety. Many departments now have safety officer positions, accountability systems and officers, and have established Rapid Intervention Teams (RIT). A safer way to operate when using breathing air in life-threatening environments should be welcomed with open arms –right? Not necessarily.

Firefighters are by nature action orientated. When they get into the battle, their focus is on putting the fire out, or mitigating the hazard. We know the job is dangerous, but tend to believe that we are always in control of our situation and aware of our surroundings (I certainly fit this category even after my close calls – yes there have been more than the one I cited earlier). However, a review of firefighter deaths, injuries and close calls (www.firefighterclosecalls.com) prove that things can go wrong quickly, and they do not have to involve major collapses or explosions. Simply getting caught on a wire, confused or delayed while exiting, experiencing a medical condition, or working beyond “the point of no return” can and does get firefighters hurt or killed.

The Point of No Return

The point of no return was defined as a position or distance within a hazardous environment at which you have just enough air to return to a clean air (safe) atmosphere. Once passed, crews stop becoming part of the solution and start becoming part of the problem. Most fire departments have some sort of occupancy in their area which is large, has below grade areas, and has a complicate layout or some other factor which can require a greater air supply than that supplied by the SCBA at the sound of the low air alarm to safely exit the hazardous area. Examples include a school, manufacturing plant, apartment building, grain silo or building full of machinery on a farm. Fires in these occupancies are rare and we do not always make the transition from single family dwellings. These occupancies need to be planned for and the responder’s air tracked closely to ensure enough time to safely exit. This could be a part of what is called situational awareness which is not only important for the officers / incident commander, but also for the firefighters.

Situational Awareness - Accountability

As I stated earlier, Mike Gagliano is a Captain on the Seattle Fire Department. One of the issues they anticipated when they implemented their air management program was that the firefighters would think that monitoring and reporting their air tank level would be a nuisance, and would be a burden during the fire fight. Mike stated that they received favorable comments from their personnel who felt that they had a much better sense of their surroundings and developing conditions – situational awareness.

When you think about it, in the early part of a fire incident, the Incident Commander (IC) is very busy and cannot closely monitor all of the crews. In many cases, staffing does not allow committing personnel to an accountability function until later. In our county, we have relied on our Anoka County Communications Dispatchers to notify the incident commander of fifteen minutes elapsed time since arrival, and to ask for a Personnel Accountability Report (PAR). This does work, but is not, in my opinion, totally effective. What we have now begun to do is to require our crews to report their air level at each ¼ tank reading, along with a progress and PAR reports. Now when our dispatchers call, we can report that we have already accomplished the PAR check.

Our new Scott Air Paks have “heads-up” air level monitoring built into the facepiece which simplifies the process. When the first person on the team notices a Light Emitting Diode (LED) indicating ¾ of an air supply remaining, he/she reports this to the team and the team radios the IC noting the air level, progress report, and PAR. Now the crew is aware of their team member’s air supply, the IC is aware of their condition, and anyone hearing the radio is also better informed. At this point the IC has time to adjust strategies, pull the crew, provide further support for the crew, and/or begin lining up a relief crew. This will happen automatically with the activation of a single LED within about 10 to 11 minutes (with 45 minute units) after the crew begins using their air supply. Situational awareness is greatly enhanced for almost everyone involved, or even those still reroute.

Getting Buy-in / Acceptance

One of the keys to getting buy-in from our firefighters is that we were able to purchase 45 minute air paks. This allows us to continue to allow 22 minutes of work time, but then also provides us with 22 minutes of exiting time as opposed to the 7.5 minutes with our old 30 minute duration paks (a threefold increase in safety). In doing so, we were still able to reduce the overall weight of breathing apparatus by two (2) pounds.

We will now be exiting the building /environment when the ½ LED illuminates. We should not be hearing low air pressure alarms on our scenes, and if we do, we will now treat the alarm as an “immediate action item.” This does not hold the same meaning as a firefighter mayday and will not necessarily trigger activation of a RIT. It does mean that we will ensure that the person with the alarm is safe and leaves, and is completely out of the hazard area.

What Did We Gain?

- Safety increases by a factor of three (7.5 minutes versus 22.5 minutes).
- Improved situational awareness by crews, incident commander (status reports), and others on the emergency scene.
- A trigger for sending PARs (approximately 11 minute intervals).
- A much better chance of extracting firefighters in trouble, or a much improved opportunity to provide them with a RIT air supply.
- Greater time available to activate a RIT, and much longer survival time for impaired crew.

- A greater chance impaired firefighter will be able to assist in their rescue due to available air supply.

Implementation

The Breathing Air Monitoring Suggested Operating Guideline (SOG) was review at a Coon Rapids Fire Department staff meeting in March, and has been implemented. We conducted live-burn training in our city on March 25th, and practiced the procedure with each of our crews. As I write this article on Easter weekend, we have responded to a townhome fire, and two attached garage fires which spread to the house. In all cases the procedure seems to be working well and, no alarms sounded!

It is very rare that we do not have a fire under control within the 20 minutes of air our air paks will provide under our new procedure. When it does happen, we are most likely in a defensive, exterior attack mode, or the situation demands great caution and evaluation before we commit additional crews, and may require evacuation.

I will post the Coon Rapids SOG and a PowerPoint presentation explaining the guideline, and rational for implementing it, on the MSFCA website under the drop-down menu item "CONF/TRAIN."

Your air is your lifeblood and your responsibility - stay safe.