Is Your Department Complying with NFPA 1404 Air Management Policy

BY STEVE BERNOCCO, MIKE GAGLIANO, CASEY PHILLIPS, AND PHIL JOSE

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Is Your Department Complying with the NFPA 1404 Air Management Policy?

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THE TOPIC OF AIR MANAGEMENT HAS BECOME very popular over the past several years, and rightly so. Structural firefighters’ actions inside the fire building are limited by the air they bring with them on their backs. If a firefighter runs out of air inside the immediately dangerous to life or health (IDLH) environment, there is a good chance that he will be seriously injured or killed.

In recent months, there have been some excellent articles in this magazine about emergency breathing techniques firefighters can use when they run low on air; about how important firefighters’ air supplies are inside a large “big box” store and warehouse; and about creating a tradition of safety, in part by managing your air supply based on the size of the fire structure.

NFPA 1404

All of these points are well made and are important aspects of air management. However, what seems to be missing in the current discussion of air management is the new section of National Fire Protection Association (NFPA) 1404, Standard for Fire Service Respiratory Protection Training, which mandates that firefighters be out of the hazard area before their low-air alarm activates. And, this begs the question: Is your fire department following the air management policy spelled out in the NFPA 1404 standard? If not, your fire department is not following national standards and could be held at fault in a court of law if a firefighter were to be injured or killed because of the failure to follow the current

Educational Objectives

On completion of this course, students will:

- Identify the basic tenets of NFPA 1404 and air management
- Describe the need for air management
- Identify air management techniques
- Describe methods of putting air management techniques into practice

(1) Firefighters making an aggressive attack of a structure fire through the front door. (Photo by Bob Moran.)
NFPA standard. We have only to look at the recent, tragic events in a major East Coast fire department to see what can happen when the NFPA standards are not followed—in this case, NFPA 1403, Standard on Live Fire Training Evolutions.

WHAT YOU SHOULD KNOW

NFPA 1404 underwent a revision in 2006. The revised standard mandates several significant changes in how firefighters use their SCBA. The most important changes have to do with the addition of an individual air management program [NFPA 1404, appendix 5.1.4(2)]. The new language states that the individual air management program shall include the following directives:

1. Exit the IDLH atmosphere BEFORE consumption of the reserve air supply begins.
2. The low-air alarm is notification that the individual is consuming the reserve air supply.
3. Activation of the low-air warning alarm is an immediate action item for the individual and team.

The revised 1404 standard mandates that firefighters be out of the fire (the IDLH atmosphere) before their low-air warning alarm activates. And, if their low-air warning alarm activates while they are inside the hazardous environment, then this is an immediate action item—comparable to a Mayday or firefighter emergency.

Think about this: The new standard says that all firefighters must be out of a fire building before their low-air alarm activates and that a low-air warning alarm going off inside a fire shall be treated with the same urgency as a Mayday. These are important changes—necessary changes—you and your department should be following right now, today! If you are not, then you are not following national standards and best practices.

The reason the NFPA mandates that all firefighters be out of the fire building before their low-air alarm activates is that this gives firefighters an emergency air reserve—the air in the last quarter of the cylinder—should something go wrong while they are inside.

The fact is that the emergency air reserve was never meant to be used for firefighting. Unfortunately, through poor information, bad habits, and a lack of proper training, the American fire service began using the emergency air reserve for operational firefighting. However, firefighters should not use this emergency air for firefighting—it is there only for emergencies. Think of it as your wife's air, your husband's air, your significant other's air, your kids' air, your parents' air, your grandchildren's air.

Firefighters can and should give three-quarters of the air in their SCBA cylinder to the citizens they are sworn to protect (photos 1 and 2). However, the remaining quarter cylinder of air is their air should something bad happen to them while they are inside the fire.

The scuba diving industry has mandated an emergency air reserve for many decades, and so should we, just as the NFPA 1404 standard dictates. There is not really much difference between scuba divers underwater and firefighters in an IDLH environment: If either of us runs out of air, there is a good chance we will be seriously injured or killed.

COMPLYING WITH NFPA 1404

To comply with the NFPA 1404 standard, we believe firefighters should follow the Rule of Air Management, or the ROAM, which states: “Know how much air you have in your SCBA and manage that air so that you leave the hazardous environment before your low-air alarm activates.”

Following this simple rule will make you and your crews safer on the fireground by providing you with an emergency air reserve (photo 3). And, the best part is that the ROAM costs nothing to implement and use. It is free. You and your crew can begin managing your air at your next fire or training exercise, and you don’t need to purchase any special equip-
ment. There is another added benefit to following the ROAM: By removing the low-air alarm from the fireground, firefighters make this alarm a true emergency alarm, not just another noisy false alarm to be ignored.

If the American fire service has learned anything over the past 10 years, it is that we need to manage our air like we manage the water supply and our crews. We must make sure that we have a full air cylinder before we enter a hazardous environment, we must monitor our air while conducting interior fire operations, and we must be out of the hazardous environment before our low-air warning alarm activates. NFPA 1404 mandates that we do this.

And so we ask again: Is your fire department following the air-management policy spelled out in the NFPA 1404 standard? Are you and your crews leaving the hazardous environment before your low-air alarm activates? If not, you are out of compliance with national standards and might well be setting yourself up for tragedy and heartache.

CHANGE AGENTS

How are you going to get your crew, your station, and your department to come onboard and adopt air management as a practice? Your personal commitment is the best start. You must be ready to implement the change and be willing to work with the resistance that is bound to come from such a proposal that fundamentally changes the way you operate. Here are some guidelines that may help you, and others, implement this change within your department.

1. Change is about getting the job done better, safer, and more effectively. Change that does not improve the “business” of firefighting will eventually fail. We can all cite examples of proposed changes that went nowhere within our organizations, but there are also many that have been successful because they improved the way the job is done. Air management improves the safety and effectiveness of teams operating in IDLH environments.

2. Resisters may be your best allies. It’s good to recognize this up front and understand that resistance is not necessarily a bad thing. It may even help to recognize that instead of “resisting” the new idea people are “actively persisting” in the current practice. People get comfortable with what works. They do not have your vision of how the new practice will work better than the current one. One important consideration is that their willingness to question the change is an opportunity to make the new practice better and to get their buy-in. Your ability to listen carefully to their concerns and address them professionally will greatly improve your success as a change agent. You will never know where your best ally or your biggest foe will come from. Keep all your interactions positive. Listen and adapt your proposals to the input you receive. With all that said, don’t fight battles you can’t win or that cost more than they achieve. In the rare circumstance that your integrity or your crew is on the line, make a stand.

3. Use the department’s informal as well as the formal structure. The informal structure is founded in the personal relationships you have established within the organization. A good example might be your first company officer or a mentor who has been influential in your career. Get him onboard early, and seek his counsel about ways to move forward. The formal structure consists of written or procedural methods of introducing ideas. A good example is a policy requiring changes in training to be submitted through a committee and approved by the training division chief.

4. Build your support from the bottom up and from the top down. At all times, look for allies in your effort to change your organization for the better. See who the other change agents are and figure out ways to help them be successful. Give others the credit whenever possible. Make your department better each day.

5. Create balance and tension. Balance yourself knowing that at the end of the day this is your job, not your religion. Being right does not require you to be righteous. Recognize that because someone does not agree does not mean he is an idiot. The relationships, in the end, are more important than winning an individual battle in your effort to implement change. However, don’t be afraid to create tension. Begin training people in the new practice. Make air management part of every drill you do. Keep adding weight onto the scale; eventually, it will move in your direction.

6. Change your department; change yourself. Being a change agent will cause you to change. You will be learning, adapting, and growing as you change your department’s practice over to air management. You will have to learn and implement new techniques, develop drills, steer conversations, listen carefully, and ultimately become a different person from the one you are today. You cannot force people to sign up on the change of practice. People must choose to join you if you hope to have success over the long haul. Implementing air management is just one change you will try to implement over your career. Do it well, and you will be better the next time around.

ONE DEPARTMENT CHANGES

The Seattle (WA) Fire Department converted to an air management department, culminating with formal policy implementation in 2004. This change, achieved over a span of approximately three years, was the result of a multipronged approach.

Seattle made the change to air management, and the practice of requiring firefighters to exit the IDLH environment before the low-air alarm activates is working today—right now. We rarely hear a low-air alarm on our fireground. When we do, it necessitates a radio report to identify the source of the alarm and the status of the firefighters involved.

How did we get here? Part one of the process was to introduce air management into the operations-level training provided each year. We have a program currently labeled “Operational Skills Enhancement Training (OSET),” which provides annual training on structural firefighting skills. Several people on the development team were committed to bringing an air
management philosophy to the department and were successful in getting basic air management skills incorporated into the OSET program.

Initially, air management was presented as a single skill station (out of four skill stations) offered during an eight-hour hands-on training day. In subsequent years, an ever-increasing air management component was added to more of the skill stations. Eventually, air management became an integral part of the entire OSET program. The department was even able to secure grant funding to provide air management training as a component of the training on newly purchased SCBA with 45-minute/1,800-liter cylinders.

A second part of the process was a commitment from the chief of the department at the time, Chief Gary Morris. Having come from Phoenix and experiencing the death of Firefighter Brett Tarver in the Southwest Supermarket in Phoenix, Morris was committed to bringing the lessons of that experience to Seattle. One of the primary recommendations of the National Institute for Occupational Safety and Health (NIOSH) in its report on the death of Brett Tarver (NIOSH FACE Report 2001-13) was that fire departments should “ensure that firefighters manage their air supplies as warranted by the size of the structure involved.” With this in mind, Morris supported the bottom-up approach used in the OSET program.

The third part of the process to change Seattle Fire into an air management department came from two forces. The first was that Seattle had a string of situations in which firefighters required medical care as a result of overheating and dehydration. These incidents resulted from repetitive work cycles in full personal protective equipment (PPE) and SCBA. Increased PPE capabilities required Seattle to recognize that the effects of repeated work cycles on firefighters must be balanced with appropriate rest cycles. A balanced approach brought together the concept of the work-rest interval. For a specific period of work, there needed to be an adequate period of rest.

The second force was the current rehabilitation policy. In fire operations, we have a policy of using a two-cylinder rotation. This policy is consistent with standard practices in other fire service organizations and publications. Each firefighter can use two 30-minute/1,200-liter cylinders in a row before a visit to rehab is required. Company officers are responsible for making sure their people are safe and enforcing this department policy on the fireground. The practice, however, did not always reflect the policy, and the policy did not adequately address environmental factors, such as the weather or the type of work performed. In addition, there was no recognition that this same rotation might be necessary on the drill ground whether operations for companies or recruit trainees.

With firefighters ending up injured, the need for a definitive work-rest interval became apparent; and the fire department administration, working with the firefighter's union, developed workable, effective, adverse weather and rehab policies and operating guidelines. Part of this policy was to clearly identify the work-rest interval. Since Seattle was purchasing new SCBA, the Joint Safety Committee was persuaded to replace the 30-min/1,200-liter cylinder with a 45-min/1,800-liter cylinder in conjunction with implementing an aggressive air management policy.

This was a dramatic change in equipment and operational philosophy, and both were occurring at the same time. Resistance was greatly diminished because the firefighters had already received training in the new operational philosophy, air management. Increasing the cylinder size while also increasing the emergency reserve provided firefighters with the same work cycle they had always used in aggressive interior operations using a 30-minute cylinder. This proved to be a definitive marker against which the length of the work cycle can be measured.

Firefighters who operate in the hazard area until their low-air alarm activates have chosen a long work cycle. In response, it is incumbent on their supervisor, and the department, to provide an adequate rest cycle to maintain an acceptable work-rest interval. The new policy requires that firefighters who work into their low-air alarm must rotate through rehab prior to returning to the fire operation. Firefighters who exit before the low-air warning activates are allowed a two-cylinder rotation prior to reporting to rehab for the first work-rest interval. Subsequent rotations are on a one-cylinder, then rehab format. In addition, company officers and battalion chiefs have environmental guidelines, including temperature and humidity charts, as guidance for decreasing the work-rest interval to maintain firefighter safety.

**GETTING STARTED**

We hope you are motivated to be a positive force for change in your department. Review your current air practices, and see if you can help your department achieve improved fireground safety and performance. Prepare yourself. Develop a plan. Put the plan in place, and make the change.

**REFERENCE**


**● Lieutenant STEVE BERNOCCO, Captain MIKE GAGLIANO, Captain CASEY PHILLIPS, and Captain PHIL JOSE are veteran officers of the Seattle (WA) Fire Department. They write and speak nationally on air management and firefighter health and safety. Their book, Air Management for the Fire Service, will be published this year by Fire Engineering.**
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To receive credit and your certificate of completion for participation in this educational activity, you must complete the program post examination and receive a score of 70% or better. You have the following options for completion.

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COURSE EXAMINATION

1. The Standard for Fire Service Respiratory Protection Training is:
   a. NFPA 1500
   b. NFPA 1404
   c. ASTM E-119
   d. ASTM E-94

2. The NFPA Standard for Fire Service Respiratory Protection requires firefighters to:
   a. The low-air alarm is notification that the individual is consuming the reserve air supply.
   b. Activation of the low-air warning alarm is an immediate action item for the individual and team
   c. exit theIDLH atmosphere before consumption of the reserve air supply begins
   d. all of the above

3. An immediate action item is comparable to a:
   a. mayday
   b. notice of violation
   c. summons
   d. code violation

4. The emergency reserve is an air bottle’s last:
   a. 1/3
   b. 1/4
   c. 1/5
   d. 1/6

5. ROAM is:
   a. the rule of air management
   b. the remaining obtainable air mask
   c. the reliable obtainable air mask
   d. the reserve of air maintenance

6. Change can make getting the firefighting job done:
   a. better
   b. safer
   c. more effective
   d. all of the above

7. The informal structure is founded in:
   a. the firehouse kitchen
   b. the training academy
   c. the structure on fire
   d. personal relationships

8. When implementing an air management program, a mentor can:
   a. suggest ways to move forward
   b. introduce you to the “informal” leaders
   c. help get union support
   d. navigate around existing regulations

9. In order to move the air management program through the formal structure:
   a. it must be approved by the Chief of Department.
   b. get “buy-in” from the company officers.
   c. submitted to a committee and approved by a training chief.
   d. it must get City Council approval.

10. Build support for an air management program from:
    a. the bottom up
    b. the top down
    c. the top and bottom
    d. none of the above

11. Someone who doesn’t agree with your proposal is:
    a. an idiot.
    b. informed.
    c. not an idiot.
    d. an opportunity to improve your debating skills.

12. Practicing the new air management protocols:
    a. adds tension
    b. adds balance
    c. will break relationships
    d. problematic
13. A low-air alarm in Seattle today triggers a:
   a. PAR
   b. evacuation of all personnel
   c. a radio report
   d. a disciplinary report

14. Seattle has implemented operations-level training in air management known as:
   a. OSET
   b. OPRY
   c. OSY
   d. LUNAR

15. Seattle uses recently purchased 45 minute cylinders with:
   a. 1,200 liters.
   b. 1,400 liters.
   c. 4,500 liters.
   d. 1,800 liters.

16. Seattle has had a policy of allowing the use of two 30 minute air bottles per firefighter before:
   a. the firefighters must go to “rehab.”
   b. the firefighters must take a mandatory 5 minute “cool-down.”
   c. the firefighters must take up.
   d. the incident commander orders the company back to quarters.

17. The work-rest interval can be reduced by:
   a. lack of lighting.
   b. humidity.
   c. spare bottle availability.
   d. OPRY.

18. IDLH stands for:
   a. intensive dangerous lethal habits.
   b. intense dangerous large hazards.
   c. instantaneous danger link hazards.
   d. immediately dangerous to life and health.

19. The NFPA Standard 1404 requires that:
   a. firefighters be outside the structure when their low-air alarm goes off.
   b. firefighters leave the building within two minutes of low-air alarm activation.
   c. all SCBA be converted to 1,200 liter cylinders.
   d. all SCBA be converted to 1,500 liter cylinders.

20. Managing air:
   a. cannot be implemented immediately.
   b. can be practiced right away.
   c. is not applicable to low-pressure cylinders.
   d. is not applicable to high-pressure cylinders.
Is Your Department Complying with NFPA 1404 Air Management Policy?

PROGRAM COMPLETION INFORMATION
If you wish to purchase and complete this activity traditionally (mail or fax) rather than Online, you must provide the information requested below. Please be sure to select your answers carefully and complete the evaluation information. To receive credit, you must answer at least six of the eight questions correctly.

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Please check the correct box for each question below.

1. ❑ A ❑ B ❑ C ❑ D
2. ❑ A ❑ B ❑ C ❑ D
3. ❑ A ❑ B ❑ C ❑ D
4. ❑ A ❑ B ❑ C ❑ D
5. ❑ A ❑ B ❑ C ❑ D
6. ❑ A ❑ B ❑ C ❑ D
7. ❑ A ❑ B ❑ C ❑ D
8. ❑ A ❑ B ❑ C ❑ D
9. ❑ A ❑ B ❑ C ❑ D
10. ❑ A ❑ B ❑ C ❑ D

11. ❑ A ❑ B ❑ C ❑ D
12. ❑ A ❑ B ❑ C ❑ D
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14. ❑ A ❑ B ❑ C ❑ D
15. ❑ A ❑ B ❑ C ❑ D
16. ❑ A ❑ B ❑ C ❑ D
17. ❑ A ❑ B ❑ C ❑ D
18. ❑ A ❑ B ❑ C ❑ D
19. ❑ A ❑ B ❑ C ❑ D
20. ❑ A ❑ B ❑ C ❑ D

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Please evaluate this course by responding to the following statements, using a scale of Excellent = 5 to Poor = 1.

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