

**PHOENIX REGIONAL
STANDARD OPERATING PROCEDURES**

Air Management

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Purpose

The following procedure outlines the “Rule of Air Management” to be employed by all members while operating in the hazard zone of an incident. The practice of working in the hazard zone until the low air alarm sounds and then leaving is an extremely dangerous situation.

As firefighters, we are responsible for our own safety and the safety of our fellow firefighters. The ability to manage our individual air supply and consumption is critical to the safety of every member working in the hazard zone. A poor decision in air management will adversely affect the individual firefighter as well as every firefighter involved in attempting to rescue that firefighter.

History

Historically, most working fires that the Phoenix Regional Dispatch System have responded to were single and multiple family residences. These structures are typically smaller in size with easy egress to the exterior. Firefighting in these “typical” residential structures resulted in a decreased focus on air supply management. When the practice of working until the low air alarm activates and then exiting is applied to fires at commercial occupancies there can be life threatening consequences.

The Phoenix Regional Dispatch System has experienced multiple incidents that have involved air supply emergencies. These incidents have typically ended with a successful intervention and have not changed the overall approach to air management. After Bret Tarver’s death at the Southwest Supermarket fire in 2001, the Phoenix Fire Department conducted numerous training exercises to examine the causes and possible solutions for life threatening emergency situations during commercial and/or “big box” fires. The exercises concluded that when the low air alarm is activated, the firefighter can travel less than 150 feet in good conditions until the air supply is exhausted. In this time, if a firefighter experiences an emergency situation (loses contact with his/her hose line, becomes entangled in wires, or becomes disoriented) the possibility of surviving the encounter is significantly reduced.

Rule of Air Management

It is the individual firefighter’s responsibility to be aware of the amount of air in his/her SCBA and his/her rate of consumption. All firefighters are responsible for managing their own air in order to leave the hazard zone before the low air alarm activates.

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Firefighters should leave the hazard zone with an emergency reserve, much like ocean divers. It is critical for firefighters to understand that the last 33% of the air supply in an SCBA is the emergency reserve. The initial 66% of air supply is the working and exiting air supply. This includes gaining access, working toward the tactical objectives and leaving the hazard zone. If an emergency situation is encountered, the emergency reserve (remaining 33%) air supply is to be used to exit or survive until assistance can arrive. These percentages are appropriate whether it is 2216psi, 3000psi or 4500psi SCBA bottle. The estimated working time for any SCBA is dependent on a number of factors. These include the intensity of the work and the fitness of the firefighter. Each individual firefighter should be cognizant of their air consumption in order to safely follow this rule of air management.

Company officers must be cognizant their crew's air consumption. The company officer must plan for the crew's exit time based physical exertion, distance required to exit to a safe atmosphere and the remaining air pressures that are reported by the individual firefighters. It is the individual firefighter's responsibility to continually assess and report his/her air consumption to his/her company officer.

Strategic Level Air Management:

The safety and welfare of all firefighters operating in the hazard zone falls directly to the Incident Commander. The strategic level of air management is an ongoing process until the hazard has been eliminated or all firefighters have successfully exited the hazard zone. Air management is an important critical operating procedure related to the survival of every firefighter. Although the incident commander is unable to directly manage that survivability profile, procedures and resources should be utilized to directly support the firefighter's safety and welfare.

It is imperative that command continually evaluates the incident using the standard hazard zone decision making model. Operating in an offensive strategy is the most dangerous position for firefighters. Air management must be a major factor of that assessment. The ability of firefighters to exit the hazard zone with a reserve of 33% air is a requirement. If crews are unable to complete their assigned task with that air supply intact, it is necessary for the incident commander to provide an adequate number of companies to replace those initial working crews or change the strategy to defensive.

The strategic level of air management should be managed similarly to the accountability of all members operating in the hazard zone. Both are managed through position and function within a command system. Command provides for improved management of firefighter welfare with early sectorization of the incident. Sector officers should manage the individual sector tactical

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benchmarks and crew welfare within the sector. Company Officers should manage the welfare of their crew. Each firefighter is ultimately responsible for his/her own welfare.

The policy of air management for the Regional Operations Consistency Committee (ROCC) is; it is unacceptable to leave the hazard zone with low air alarms activated during normal operations.

This policy requires firefighters to leave without using their emergency reserve. This policy will require that command and sector officers pessimistically forecast the resources required to complete the tactical objectives in each. Fire crews are less apt to leave an operating tactical position if there are no crews in position to replace them in the incident operation. It is the Company Officer's responsibility to manage the welfare of his/her crew; command must support these crews with adequate replacement resources. The intent is not to adversely impact the active firefight, but to strengthen firefighting operations with crews that have safe air levels. Companies can be assigned only as fast as they arrive. A pessimistic approach would provide needed replacement crews sooner, thus enabling them to follow the air management procedures. These resources should be layered in as either working, on-deck or recycling.

Time is a significant factor in both fire involvement and the air management of crews operating within the hazard zone. It is impossible for the strategic level to manage the individual operating times of all sectors or crews operating within the hazard zone. Each sector officer is required to manage the time crews operate inside the hazard zone within their sector. The strategic level will manage the entire elapsed time for the incident and the effect time has on the structure or hazard.

Tactical Level of Air Management

Captain Level Sector Management

In the initial stages of rapidly escalating fire incidents, company officers assume the role of the initial sector officer and are responsible for the tactical level air management of the sector. The first Captain to the area will typically remain working with his/her crew and will manage the tactical objectives for the sector and task level operations for his/her company. As other companies are assigned to that sector, the initial sector officer will be at a disadvantage in attempting to manage the welfare (specifically the air consumption) of those crews. The initial sector officer will need support from all captains in that sector to closely manage their crew's air. As the incident escalates, command must assign a tactical level Chief Officer to manage the sector operations.

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Battalion Chief Level Sector Management

The tactical level of fireground operations has more direct control of individual crew air management (specifically the air consumption time) than the incident commander. However, the sector officer is often required to manage the sector operations from just outside the hazard zone. This requires close management of work cycles and accountability in order to actively monitor crew air supplies. This is done by the team of the Battalion Chief and the Field Incident Technician (F.I.T.) or Incident Safety Officer (I.S.O.). Typically, the F.I.T. / I.S.O. will monitor the work/rest cycles of operating companies within the sector while the Battalion Chief manages the completion of the tactical objectives. One of the many responsibilities of the F.I.T. / I.S.O. includes monitoring the time operating within the hazard zone and providing reminders to crews of elapsed times on SCBA air.

It is necessary for sector officers to perform their own hazard assessment and apply the standard decision-making model within their portion of the overall incident. This assessment verifies the overall risk management and strategy from the tactical viewpoint. It should also ensure that the actions within the sector match the strategy and risk management profile of the overall incident. The sector officer must define where the crews will operate in the building and what tasks need to be completed. These actions have to be balanced with air management and a well communicated exit plan.

Sector officers must provide pessimistic reports to command regarding resources needed to provide uninterrupted work cycles within the sector. This is necessary until the tactical benchmarks are met within that sector. It is important to have ample crews to provide immediate relief to crews that have diminished their air supply. This requires maintaining adequate "on-deck" resources. Adequate "on-deck" resources provide crews to cycle into the hazard zone as well as crews that are ready to react to a "Mayday". Early forecasting of necessary resources will provide command with the information needed to establish resource requirements for the overall incident.

There is no greater concern for sector officers than the welfare of crews working within the sector. Crew air management is a critical factor in determining the risk management of an operating sector. If critical fireground factors or the ability to manage air supplies change negatively, then this should be communicated to command and a re-evaluation of the strategy should be conducted.

Task Level Air Management

Individual firefighter air management is the foundation of this air management policy. No incident command system or structure can overcome a lack of individual firefighter air

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management. The policy is to leave the hazard zone prior to the SCBA low air alarm sounding. This leaves an emergency reserve of 33% air capacity if an emergency situation arises. Firefighting operations, at all levels, should revolve around this standard.

Personal accountability for the SCBA is critical. Firefighters are expected to manage their assigned SCBA for the entire work shift. This requires thoroughly checking the SCBA prior to shift, after using it, and whenever the functionality is in question. Firefighters are expected to know the air level of their SCBA prior to entering the hazard zone, during firefighting activities and upon leaving the hazard zone. This standard has been known as a “round trip ticket”. The ability to monitor this supply during firefighting activities is a learned skill/habit. It is necessary that company officers reinforce the need to adhere to work cycles to their crews. Command and sector officers should ensure confidence that the work will continue while the relieved crews are refilling and returning to on-deck in their sector.

Air management is critical to individual firefighters as well as to their crew and company officer. The company officer is responsible for the management of air for the entire crew. It is the responsibility of the individual firefighter to monitor his/her air supply and to communicate this with the Captain. Captains are expected to be proactive and inquire about the air level status of their crew. Captains should incorporate the use of triggers to assess their crew’s air supply. These can be the announcement of the completion of tactical benchmarks, elapsed time notifications or built in 50% notification alarms on some SCBA manufacturers. The use of triggers is a learned skill and will require consistent training and practice. Captains can only address situations that they are aware of. The communication of individual air levels is critical.

Low air emergencies or other mayday events pose an extreme danger to firefighters involved in rescue efforts. Data obtained from training exercises after the Southwest Supermarket fire indicates that it takes 12 rescuers to remove one firefighter in a “MAYDAY” situation. The data also demonstrated that one out of every five rescuers will end up having a “MAYDAY” situation and require assistance exiting the hazard zone. This creates a deadly cycle. Air management at all levels of command as well as individual firefighter responsibility is critical in the prevention of these situations. If members believe themselves or other members to be in this situation, the call for a “Mayday” should be immediate.

One requirement for a firefighter to be “MAYDAY” ready is that they are able to effectively don, doff and manipulate the PASS Device and the emergency bypass on their SCBA valve with gloved hands. This is also a learned skill that is perishable if not trained on consistently. This is the standard established in NFPA 1500.

Fire crews operating inside structures should always have an “exit plan”. This is not just the responsibility of the Captain. The Captain should communicate to the crew his/her exit plan.

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The individual firefighters are responsible for maintaining awareness of the plan and how to execute the plan. The plan defines how the crew is going to leave their area of operation (hazard zone). The best plan includes leaving the hazard zone following the hose line out that you came in on. This includes normal operations as well as emergency situations. The plan should include the entrance taken into the building, the dedicated hose line, knowledge of other means of egress within the sector and other crews operating in the sector. This plan also includes the amount of air it takes to leave the hazard zone prior to the low air alarm sounding. The larger the building, the more important and difficult the exit plan becomes.

The results of the testing after the Southwest Supermarket has stated that the maximum distance a fire crew will enter any building is 150 feet without additional support mechanisms put in place by command. This defines only the distance into the building. This does not account for the air it takes to maneuver a hand line into this position. The effort required (air consumption) to place lines in operational positions inside the building is critical to managing air and time operating inside the hazard zone. Crews and company officers must account for this effort within their entrance and exit plans from the hazard zone.

There is one air management policy for residential and commercial occupancies of all sizes for the Regional Operations Consistency Committee (ROCC). Command, sector officers, fire crews and individual fire department members are expected to manage their air supplies in the same manner on all types of incidents.