



We Have Permission to Use the Word Mayday

[Dr. BURTON A. CLARK](#)

I can hear some readers now: "What do you mean we have permission to use the word Mayday- we have been using it all along! What's the big deal?" It is not a "big deal" but it is an important "little deal". Having a common understanding and use of words is a significant foundation of professionalism. In addition, words can have a powerful influence on our cognitive and affective responses to the verbal cues. Think of what happens to you when you hear the phrase "Working Fire" over the radio as you are responding. Is the term Mayday a word to be used by the fire service?

A colleague and friend Howard Cross, who studied French for six years, explained the origin of the word Mayday to me. Mayday comes from the French "m'aide" (literally; help me), the root verb being aider (to help). Knowing the source and meaning of a word is important to our comprehension.

As you know, our Firefighter I and II Standards do not use the word Mayday. When I was writing about the concept of Mayday Decision Parameters for firefighters, I was advised that the word Mayday had not been accepted as the standard firefighter distress call. Since I was studying our Mayday Doctrine, someone sent me a copy of the 2002 NFPA 1500 standard. In the Appendix A.8.1.11 in bold print, it states: "The term mayday should not be used for fireground communications in that it could cause confusion with the term used for aeronautical and nautical emergencies." My first reaction was confusion; our radios have a difficult time talking to each other across the street. How could they interfere with a plane or ship in distress?

I became curious. Who is the authority having jurisdiction (AHJ) over the word Mayday? The AHJ over the word Mayday is the National Search and Rescue Committee (NSRC) in Washington, DC. The Committee is composed of the Departments of Defense, Interior, Commerce, and Transportation, in addition to the Federal Communication Commission and the National Aeronautics and Space Administration. The Chairman is Rear Admiral Ken Venuto of the US Coast Guard.

I wrote to the Admiral at the NSRC: "Many fire departments nation wide use the term "Mayday-Mayday-Mayday" over fire ground radios as part of their emergency procedures when a firefighter's life is in danger. ?(I enclose a copy of the NFPA 1500 standard A.8.1.11) My questions are: Will a firefighter calling Mayday, on the fire ground over a fire department radio, cause confusion in the aeronautical and or nautical emergency communications system? If not, does the National Search & Rescue Committee see any reason the fire service should not use Mayday-Mayday-Mayday as the distress call for firefighters?"

Captian Steve Sawyer US Coast Guard, Alternate Chairman, NSRC wrote me back, hear are some excerpts: "Use of MAYDAY under such circumstances is permissible under U.S. law and regulations [the ones sighted were International Radio Regulations (2001), Paragraph 4-9 and FCC rule (Part 80.311)]. The radio frequencies concerned are different from the aeronautical and maritime frequencies, so use of the term should not cause confusion. Further, any effective means of calling for help is authorized under other national and international radio

regulation for true distress situations. The U.S. has taken no action to preclude use of the word Mayday by endangered firefighters.

Mayday is recognized nationally and internationally as a signal meaning life is in danger and immediate assistance is required, although federal regulations only mention its use for ship and aircraft.

The above guidance is based on review of the regulations and consultation with experts of the Coast Guard, FCC, International Civil Aviation Organization and others.

We trust that this explanation will help not only for your local training and operations; you may also find it useful seeking to update relevant guidance in NFPA or other standards, as appropriate."

I have forwarded this information to the NFPA 1001 and 1500 committees. Thanks to our consensus standards making process, the fire service has increased its common understanding and use of words. Fire Service Doctrine comprehension helps us in our continuing quest to become a true profession. We have permission from the NSRC to use the word Mayday. Our next step is to decide if we choose to use it. Mayday the word is just a "little deal" - unless you have to call it. I pray someone hears you when you call out "help me" in any language.

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When Would You Call Mayday! Mayday! Mayday?

Dr. BURTON A. CLARK

Hopefully you will never need to call mayday for yourself, or any other firefighter. But you need to be prepared to do so because your life may depend on this single decision.

When firefighters are asked, "When would you call Mayday?" you get some unexpected answers like: "I push the orange button on my radio." or "I don't have to worry about that because I am on the engine company and I have the hose line to find my way out. It is the truckees that go above the fire that need to call mayday." These are actual answers from career firefighters in large metro fire departments.

When you push firefighters to answer the question they will usually rely on the statements in their SOP like "When Lost-Missing-Trapped and their life is in danger firefighters will announce Mayday-Mayday-Mayday." When you ask the firefighter to give an example of Lost, Missing or Trapped they have a difficult time coming up with a specific example. Then they start including statements like "It depends on your experience" even though they have never had the experience of calling mayday.

The problem is that we have not clearly defined lost, missing, or trapped. We leave it up to each firefighter to define these terms. Somehow we think firefighters will intuitively know when to call for help. This is a very dangerous assumption. Presently we do not teach firefighters when and how to call mayday at the cognitive, affective, and psychomotor levels of learning to the Mastery level of performance.

If a firefighter must perform a decision making process and execute a set of skills very rarely or never in their career but the decision and behavior have life or death consequences they must be trained and retrained throughout their career.

We can learn from how the military trains pilots to eject. First, there are very specific ejection decision parameters for each type of aircraft. The ejection decision parameters are a series of IF- THEN logic statements for example: If conditions for no-flap carrier landing are not optimum, eject. If neither engine can be restarted, eject. If hydraulic pressure does not recover, eject. If still out of control by 10,000 feet above terrene, eject (NATOPS flight manual F-4J, US Navy 1995). There can be a dozen or more ejection parameters for a specific aircraft.

Once the trainees have these memorized they will confront these parameters at any time during flight simulator training. One pilot indicated that he had to eject 60% of the time during flight simulator training. Pilot trainees must then train physically on the ejection trainer. This is an ejection seat fixed to a vertical rail that catapults the student up, simulating the ejection process. The student must pass the process at the 100% proficiency level (70% is not a passing score on one chance -- only life and death tasks).

Once the pilot and crew get their wings they still retrain on ejection every 6 months. They are also required to have flight simulator drills 6 times per year, during the training sorties they will be forced to make the ejection decision 3 or 4 times with 100% accuracy. The ejection doctrine is reviewed before every takeoff at the preflight briefing. Finally, each member of the crew realizes that the pilot is in charge of the plane but individuals are in charge of their ejection seat. Any crewmember can make the ejection decision if conditions fall within the ejection parameters (Capt. William "Stainless" Steele USAF personal interview May 16, 2002 {Stainless is a B1 bomber pilot he and his crew ejected December 12, 2001 over the Indian Ocean}).

In spite of all this training and practice pilots still fail or delay to eject. According to Richard Leland, Director Aeromedical Training Institute Environmental Tectonics Corp., there are 10 reasons for failure or delayed ejection that must be addressed in ejection training:

1. Temporal Distortion (time seems to speedup or slow down).
2. Reluctance to relinquish control of one's situation.
3. Channeled attention (continuing with a previous selected course of action because other more significant information is not perceived).
4. Loss of situational awareness (controlled flight into terrain).
5. Fear of the unknown (reluctance to leave the security of the cockpit)
6. Fear of retribution (loss of the aircraft)
7. Lack of procedural knowledge
8. Attempting to fix the problem.
9. Pride (ego)
10. Denial (this isn't happening to me.)

The military model of developing ejection doctrine may be useful to the fire service to develop Mayday doctrine for firefighters. The ejection doctrine for pilots begins as follows. "The first and absolutely most important factor in the ejection process is the decision to eject" (Ejection seat training operations and maintenance manual. p.3-1, Environmental Tectonics Corp. Southampton, PA 1999). "You should understand that the decision to eject or bailout must be made by the pilot on the ground before flying. You should establish firmly and clearly in your mind under which circumstances you will abandon the aircraft" (Ejection seat trainer. p2 Environmental Tectonics Corp. Southampton, PA).

Based on this assumption we developed a draft Mayday Decision Parameters for a Single Family Dwelling (SFD). The SFD was selected because it is a basic type of structure fire common to many fire departments, it is a high risk to firefighters, and was describable. Keep in mind that we will need a Mayday Decision Parameter for each type of structure we enter. A qualitative method was used that included brain storming (individual and small group) to create the specific parameters (the first research team to help develop these parameters were John Koike, Dennis Culbertson, Tommy Harmon, Linda Pellegrini, and Tom Wiley of the NFA Interpersonal Dynamics Class Dec. 20, 2001 instructors Paul Burkhart and Howard Cross, research advisor Burton Clark). An opinion survey, using

convenience sample populations (N=339), was used to determine if firefighters agreed or disagreed that they must call a mayday under specific conditions. This research methodology has significant limitations because it relies on judgment and opinion. The results are not conclusive and have not been field-tested. They are presented only to foster further discussion and study of fire service Mayday doctrine.

Survey Results 339 Respondents

MAYDAY DECISION PARAMETERS: SINGLE FAMILY DWELLING DETACHED, 1 or 2 STORY WITH OR WITHOUT BASEMENT* IDLH ENVIRONMENT SCBA IN USE

A firefighter must call a mayday for themselves under these conditions.	
% said YES	Possible Mayday Conditions
98%	Tangled, Pinned, or Stuck; low air alarm activation, Mayday
94%	Fall through roof, Mayday
92%	Tangled, Pinned, or Stuck and do not extricate self in 60 seconds, Mayday
89%	Caught in flashover, Mayday
88%	Fall through floor, Mayday
82%	Zero visibility, no contact with hose or lifeline, do not know direction to exit, Mayday
69%	Primary exit blocked by fire or collapse, not at secondary exit in 30 seconds, Mayday
69%	Low air alarm activation, not at exit (door or window) in 30 seconds, Mayday
58%	Cannot find exit (door or window) in 60 seconds, Mayday

***ASSUMPTIONS:** SFDs usually have a front door and back door. Most rooms, except for bathrooms, have at least one window that could be used as an exit. The exception to door and window assumptions will be the basement, attic, hallways, closets, storage areas, and attached garage. NOTE: SFDs with bared windows or windows too small or too high from floor to use as an exit are excluded from this MDP.

Respondents: this was a convenience sample made up of National Fire Academy students N=181 Executive Fire Office Program graduates N=96, and Fire Department Instructors Conference students N=62 all respondents read the original Mayday article and or were given an oral briefing on its contents before answering the survey. The responders ranged from recruit firefighters to fire chiefs, career and volunteer, small rural to large metro.

A significant challenge to firefighters under IDLH conditions is carbon monoxide affecting their judgment, motor skills, and sensory perception. In addition the environmental conditions smoke, heat, gases, and structural stability can change very fast and become deadly. The rapid intervention team takes time to rescue a firefighter; the window of survivability can be small.

The same 10 factors that cause pilots to fail or delay ejection may apply to firefighters failing or delaying to call mayday. Is it better for 100 firefighters to call mayday and not need it, then one firefighter not to call mayday and need it? By reacting to decision parameters a firefighters perceived

need for help is eliminated from their decision-making process. For example, if you fall through a floor you may not be injured, there may be no fire or smoke, you may be able to get up and walk right out of the building. The condition of falling through the floor is not normal something has gone wrong, your judgment is impacted on and the event may be fatal. Calling mayday immediately is the only 100% correct response and that still does not insure survivability.

The fire service has rules to protect us: wear you seat belt, stop at red lights, wear you SCBA, use BSI, have a backup spotter. We do not rely on the firefighter's perceived need to comply with the rule or experience of the consequences to comply with the rule. Firefighters are expected to follow the rules and we hold them accountable. No one gets in trouble for following the rules. What are the rules for calling Mayday?

The purpose of this article is to generate discussion and research on fire service Mayday doctrine. The questions we need to answer are: What are the Mayday decision parameters for firefighters? How do we teach the Mayday decision-making process to firefighters? How much Mayday practice do firefighters need?

When would you call MAYDAY? That is a good question to ask all the firefighters in your department. Let us know if they all get the answer 100% CORRECT.

Steven Auch, Captain Indianapolis FD & Raul Angulo, Captain Seattle FD contributed their knowledge and expertise to this article

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Mayday! Mayday! Mayday!

Do firefighters know when to call it?

[Dr. BURTON A. CLARK](#)

These must be the most frightening three words that can be heard over the fire ground radio. Everyone who hears the call knows that what was a public emergency, which we the fire department came to solve, has now become an emergency for us. Something has gone wrong and one of our own needs help.

Every fire department in the country has detailed SOPs explaining who on the fire ground will do what, when a firefighter calls MAYDAY. The RIT is activated, radio channels are changed, additional chiefs and units are dispatched. We have all trained extensively on these procedures. We have developed special techniques on how to get downed firefighters out of tight spaces or up through holes. And we carry an RIT bag on the apparatus.

All this is important, but it is the easy part of the process. We have almost completely ignored the most important first step, getting the firefighter to recognize they are in trouble and need to get help, to call MAYDAY.

What mayday decision parameters have we given firefighters? How do we teach the cognitive and affective mayday decision-making process? How do we teach the psychomotor skill to execute the decision?

We have not answered these questions satisfactorily. Our standards and training are woefully lacking for this critical firefighter personal life saving competency.

The NFPA 1001 Standards for Fire Fighter Professional Qualifications (1997) does not definitively address the concept of mayday. The word mayday is not used in the standard. There is a mayday inference in the Firefighter I Standard 3-2.3 that reads, "transmit and receive via fire department radio". The firefighter is to know "Departmental radio procedures and etiquette for routine traffic, emergency traffic". The skill is " the ability to operate radio equipment and distinguish between routine and emergency traffic" (p.1001-1).

Mayday is again alluded to in Standard 3-3.4. It reads, "Exit a hazardous area as a team"; knowledge "elements that create or indicate a hazard"; skill "evaluate area for hazard" (p. 1001-7).

There is more verbiage on auto extraction than mayday in the standard. In Firefighter II the only standard that comes close to mayday is 4-2.3. It reads, communicate the need for team assistance; knowledge ;fire department radio communications procedures; skill; the ability to operate fire department communications equipment. This standard seems to be about routine assistance not

mayday conditions.

The Firefighter's Handbook (2000), chapter 23, has a section titled: Firefighter's Emergencies. The opening paragraph reads in part, To help understand the actions to be taken during an actual or potential firefighter emergency, the firefighter must study procedures for rapid escape and declaring a mayday for lost or trapped situations. (p. 690). Under entrapments it reads, "The first step a firefighter should take in an entrapment is to get assistance. Activation of a PASS device is warranted and the declaration of a 'mayday' should be made over the radio. (p. 692). Under the heading of "Lost firefighter" it reads, "We cannot overemphasize that a fighter or team lost in an IDLH atmosphere is in fact experiencing a firefighter emergency" (p. 692). "First, the firefighter or team must report the fact they are lost. This is also a mayday situation and should be transmitted as such over the radio (p. 693).

Essentials of Fire Fighting (1998) does not refer to the word mayday. In the "Rescue and Extrication" chapter there is a section titled "Trapped or Disoriented Firefighters". In regard to disoriented firefighters it states, "If they are not having any success finding their way out, they should find a place of relative safety and activate their PASS devices" (p. 181).

For trapped firefighters it states, "These firefighters should immediately activate their PASS devices. If either trapped or disoriented firefighters have radios, they should try to make radio contact as quickly as possible with other personnel on the emergency scene" (p. 182). Our mayday standards and training doctrine clearly indicates that we have not researched the concept of a firefighter-calling mayday scientifically.

To study the concept of a person recognizing they are in trouble and need help, I tried to do some benchmarking by looking to others who have addressed similar issues. The place I started with was Navy fighter pilots and the concept of ejection from their aircraft.

In terms of macho, firefighters and Navy pilots are about equal. This is the first assumption I made. Next, the decision to pull the ejection cord is similar to the firefighter making the decision to call mayday. Both the pilot and the firefighter are using their last resort to save their life. The ejection mechanism and our system to save downed firefighters are useless until the individual in trouble cognitively and effectively recognize this fact and act accordingly.

When the pilot punches out, the aircraft is lost. There is the potential for injury to people and property on the ground, and the pilot may be injured or killed. When a firefighter calls mayday, other firefighters are put at risk to save him or her. The mayday decision for the fire service must be considered extremely consequential.

The ejection doctrine for pilots begins as follows. "The first and absolutely most important factor in the ejection process is the decision to eject" (Ejection seat training operations and maintains manual. p 3-1, Environmental Tectonics Corp. Southampton PA 1999). "You should understand that the decision to eject or bailout must be made by the pilot on the ground before flying.

You should establish firmly and clearly in your mind under which circumstances you will abandon the aircraft" (Ejection seat trainer. p2. Environmental Tectonics Corp. Southampton, PA).

A key source of Navy ejection doctrine is the NATOPS manual for each aircraft. The Naval Air Training and Operating Procedures Standardization Program (NATOPS) is a positive approach toward improving combat readiness and achieving a substantial reduction in the aircraft accident rate.

Standardization, based on professional knowledge and experience, provides the basis for development of an efficient and sound operational procedure. The standardization program is not planned to stifle individual initiative, but rather to aid the Commanding Officer in increasing his units' combat potential without reducing his command prestige or responsibility. (W.D. Houser, Vice Admiral, USN. Letter of Promulgation. May 1, 1975).

The U.S. Navy F-4J jet fighter NATOPS flight manual (1995) contains the following ejection parameters:

- If conditions for no-flap carrier landing are not optimum, eject.
- If neither engine can be restarted, eject.
- If a fire exists after catapult launch, should control be lost and not regained immediately, eject.
- If control speed/gross weight combinations exceed available arresting gear limits, eject.
- If field landing cannot be made, eject.
- If hydraulic pressure does not recover, eject.
- If carrier landing and all landing gear is up, eject.
- If carrier landing and one main plus nose gear up, eject.
- If the combination of weather, landing facilities and pilot experience is less than ideal, consideration should be given to a controlled ejection.
- It is recommended that a landing on unprepared terrain not be attempted with this airplane, the crew should eject.
- If still out of control by 10,000 feet above terrain, eject.
- If the flap and or BLS failure occurs during the catapult stroke or shortly thereafter, eject immediately.

It is important to remember that each different type of aircraft has its own ejection parameters. Pilot ejection training consists of classroom and flight simulator to develop cognitive and effective skill. Then the ejection seat trainer is used to imprint the psychomotor skill. Ejection retraining occurs every 6 to 12 months.

The failure or delay to eject can be attributed to 10 reasons that must be addressed in ejection training according to Richard Leland, Director Aeromedical Training Institute Environmental Tectonics Corp.

1. Temporal Distortion (time seems to speedup or slow down).
2. Reluctance to relinquish control of ones situation.
3. Channeled attention (i.e. continuing with a previously selected course of action because other more significant information is not perceived).
4. Loss of situational awareness (i.e. controlled flight into terrain).
5. Fear of the unknown (i.e. reluctance to leave the security of the cockpit).
6. Fear of retribution (for losing the aircraft).
7. Lack of procedural knowledge.
8. Attempting to fix the problem.
9. Pride (ego).
10. Denial (i.e. This isn't happing to me).

By now some readers are thinking fighter pilots have it easy because the instruments in the cockpit do not change. The positions of the needles move and when enough gages are in the red it is time to eject.

Firefighters do not have gages to read or clearly defined input data and the critical information is dynamic throughout the emergency event. Each type of structure we enter, i.e. single family, duplex, garden apartment, triple-decker, high-rise, commercial, industrial, taxpayer, etc., may require specific mayday decision parameters. Once we determine the parameters we need to recognize them and act correctly. Will we?

Over a year ago the Chesterfield, VA Fire Department conducted a lieutenant's test. Part of the testing included a field activity. Seventeen candidates for lieutenant were taken to a large abandoned building, 80 x 120 with an open floor plan. One at a time, in full turnouts, SCBA with less the 700psi, portable radio, and Nomex hood on backwards covering their face mask, each candidate was taken into the building and told the following. "You are the OIC of the first engine operating at a fire in a Shopping Mall.

You and your crew are stretching a 1 3/4 hand line at the top of the escalator on the second floor and you encounter "cold" smoke and zero visibility. While maintaining voice contact with your crew, you have been searching for the fire. You no longer have voice contact with you crew and are now lost and disoriented. This is not a training scenario, your life depends on your actions!" (By Heather Casey. Test asks: Can you Survive? Firehouse.Com News, Sept. 28, 2000). The correct actions to take were:

- Declare an emergency on the radio
- Activate the emergency button
- Announce ?Mayday, Mayday, Mayday, Emergency Traffic?
- Activate the PASS device
- Successfully merge with the RIT

Of the 17 candidates, only four took the correct action immediately. The fastest times to complete the tasks were four to five minutes. Some of the candidates never called Mayday (Personal communications Capt. Dave Daniels, Chesterfield FD Sept. 25, 2001).

This outcome should raise concern for all of us because the candidates were put into the Mayday decision parameters and most did not make the correct decision immediately. In other words they were told the gages are in the red and still did not react correctly. Remember, on the real fire ground each firefighter must read the gages, determine the meaning, and then make the Mayday decision. Again I ask. What are the Mayday decision parameters for firefighters? How do we teach the Mayday decision-making process to firefighters? How much Mayday practice do firefighters need? I don't have the answers to these questions. The military aviation method of creating ejection doctrine may serve as a model for us to use in answering these questions. We need to get our best minds researching the questions to create firefighter Mayday doctrine. I do know this. A firefighter's decision to declare a Mayday is made in the fire station before they get on the apparatus. So, at your next company drill, ask this question. When would you call Mayday?

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You Must Call Mayday for RIT to Work Will You

[Dr. BURTON A. CLARK](#)

BY Dr. BURTON A. CLARK, EFO; RAUL A. ANGULO; and STEVEN AUCH

You have probably participated in some type of rapid intervention team (RIT) or "Saving Our Own" training, and your SOPs may have some directions on a Mayday. The odds are, however, that you have not been given specific rules on when to call a Mayday. You are taught to be the rescuer, not the victim, and your Recognition-Primed Decision-Making process (defined below) may interfere with your calling a Mayday when you should.

What does this mean for firefighters? First, it means that we've put the cart before the horse. It doesn't matter how well trained or well equipped your RIT is. Unless the incident is witnessed, RIT teams won't be activated unless you or your partner calls a Mayday. The training emphasis has been on saving our own, not on our own calling for help. We would hate to speculate, but firefighters might have survived had they recognized early enough that they needed help or that something was out of the norm and they had called a Mayday. Deputy Assistant Chief Curt Varone, of Providence, Rhode Island, has verified our thoughts by identifying 11 structure fires between 1978 and 2002 in which failing to call or delaying a call of a Mayday contributed to 24 line-of-duty deaths (LODDs).¹

Firefighters do not like to admit that they might need to be rescued. The delay in calling a Mayday may be caused by many factors, but three need to be addressed immediately: (1) the stigma associated with admitting to yourself and letting others know you need help, (2) not having been given clear rules for calling a Mayday, and (3) the manner in which the fire service makes decisions.

Last year, the Seattle (WA) Fire Department had three near-miss incidents involving firefighters in interior firefighting operations. Each of these incidents easily could have led to LODDs, had help taken a few more seconds to arrive. The particulars of these incidents were detailed in "Train in 'the Rule of Air Management' " (Fire Engineering, April 2003). All three firefighters—a captain, a lieutenant, and a firefighter—are seasoned veterans and well-respected members of the department.

There were some disturbing similarities in the three incidents:

- None of the firefighters in distress called for a Mayday.
- None of their partners called for a Mayday.
- No one activated the emergency button on the radio.
- No one activated his PASS device.
- None of the partners activated a PASS device.

- Each firefighter became separated from his partner.
- Each firefighter ran out of air.
- Each firefighter suffered debilitating effects of carbon monoxide.

When interviewed, one firefighter said, "I knew I was in trouble. I thought about using the radio, but I thought, 'I found my way in; I can find my way out.' "

Peer pressure and the "stigma" surrounding the idea that help is needed played a part in each incident. These firefighters realized that events were not unfolding correctly. They were all trying to find their way out of the building, but they couldn't. They all ran out of air. They all tried alternative filter-breathing techniques. But in the end, exposure to carbon monoxide impaired their judgment and motor skills.

ESTABLISH MAYDAY DECISION-MAKING PARAMETERS

To ensure that firefighters will call for help as soon as they recognize that they may be in trouble, fire departments need to develop clear Mayday decision-making parameters (rules that specify when a Mayday must be called) and institute Mayday training programs firefighters must take and continue to pass throughout their fire service experience. The parameters/recommendations are based on logic similar to that used to establish training programs that teach military fighter pilots when they should eject from their planes in an emergency.²

Fighter pilots are given clear, specific ejection parameters (rules governing when to eject), and they are trained and retrained on making the ejection decision and drilled on actually pulling the ejection cord several times a year. The comparison of firefighters' calling a Mayday to pilots' ejecting from their planes makes good sense, according to Kelly M. Woods, a former Navy fighter pilot who had to eject over North Vietnam when his jet plane was shot out from under him. After military service, he became a career firefighter. He and his partner were advancing a line down a basement stairway when the stairway collapsed, pinning him under the stairs. His partner called a Mayday. Today, Woods is an instructor with the West Virginia State Fire Academy.

It may seem strange that we have to create rules to tell firefighters to call a Mayday. But, remember that we teach firefighters to be aggressive and expect them to act aggressively.

Chief Alan

Brunacini of the Phoenix (AZ) Fire Department noted at the 2002 Maryland Fire Chiefs Conference: "The hardest thing to do is to put a firefighter in reverse." Think of how we train firefighters. Do they ever fail to put out the fires in rookie school, or do they ever have to make the decision to retreat? Are firefighters ever put into training or drill situations in which they have to make the decision to call a Mayday for themselves? If the answer to these questions is no, how can we expect our firefighters to make these decisions under real-world life and death conditions?

THE DECISION-MAKING METHOD

The manner in which we make decisions may be part of the problem also. Klein Associates researchers analyzed how U.S. Army battlefield commanders make decisions. We are using the military-fire service comparison because firefighters, like the military, must make decisions "while confronting time pressure, [under] changing conditions, [for] high stakes, and [with] unclear immediate goals and incomplete information."³

The Klein study describes the cognitive process used to make decisions on the fireground, referred to as "Recognition-Primed Decision-Making (RPD)." As an example, officers arriving on the scene look at the picture (visual cues: fire, smoke, construction, time of day, occupancy, and so on) in front of them and then compare that picture with the pictures in their memory bank. When a match is found, they choose what worked at a similar situation in the past and use that experience to drive their strategy and tactics for the present situation.

This is a very rapid decision-making process. The first option chosen and followed is also most likely the only option considered. RPD is effective most of the time but not all of the time. Kline states: "Unfortunately, the first option may not be the best decision." (3, 43) This memory bank of pictures and actions we have to choose from has been developed over years of experience and training. It has been referred to as a "photographic slide tray." Using this analogy, we might say that "we may be missing some slides." RPD isn't limited to command-level officers; we all use it.⁴

RPD AND MAYDAY

What does RPD have to do with Mayday? Remember that all three Seattle firefighters, two officers and one firefighter, were experienced. They had gotten themselves out of tight spots before; all said they had experienced running out of air and using the filter breathing method (disconnecting the low-pressure hose from the regulator and putting the end in the turnout coat to breathe) to get out at previous fires. None had ever had a Mayday called for them. They were using RPD to respond to the situation at hand, but it did not work this time. It is safe to assume that the Mayday-calling slide was not in their RPD slide tray.

Do you train firefighters in the simple act of using the radio to practice calling a Mayday? If not, maybe you should. For example, at a working fire, an officer fell through the floor into the basement. His radio transmission was, "14's in the basement."⁵ He never called a Mayday. Other factors also contributed to this LODD. We do not know if he had the Mayday-calling slide in his RPD slide tray.

Our firefighters may not be prepared to call a Mayday for themselves. Following is a summary of research conducted for previous articles. The tests covered making decisions pertaining to calling a Mayday.

- The New Iberia (LA) Fire Department conducted a drill to determine if the firefighters would call a Mayday for themselves. An open space 60- 2 100-foot building was used; 400 feet of hose was stretched through the building, and 18 teams of two members and one team of three members were sent in one team at a time. They were told to follow the hose and assist another team at the end of the hoseline. The conditions were immediately dangerous to life and death (IDLH), cold smoke, and zero visibility (masks were blacked out). Their SCBAs had only 800 psi in them (only three firefighters noted the low air). Thirty-nine members participated—17 captains, 14 drivers, and eight firefighters. All personnel had a portable radio assigned to them on the apparatus; only 18 of the 39 firefighters took their radio in with them. The situation made it impossible to fulfill the assignment of joining the other team at the end of the hose.

Training Officer Martin Delaune reported the following:

—Four kept going until their air was depleted.

—After the low-air alarm activated, 22 kept going forward for four minutes.

—After the low-air alarm activated, eight kept going forward for three minutes.

—Two discussed the situation for 2.5 minutes before beginning the retreat after alarm activation.

—Three began the retreat when the low-air alarm activated.

—Three activated their PASS alarm.

—Two radioed a Mayday.

—None survived. They all ran out of air before they got out.⁶

- The Fort Worth (TX) Fire Department tested about 500 firefighters (four companies at a time) in a RIT/Mayday drill. A large open-floor plan building was used. A charged 145-foot 1 3/4-inch attack line went from the entrance door into the building. One loop had been placed in the line. The conditions were IDLH and zero visibility (masks blacked out). The line ended at a doorway that led into a suite of three offices. A manikin was placed in one of the rooms. The teams were told to rescue the downed firefighter near the nozzle.

About one quarter (about 130) of the firefighters were unsuccessful in exiting the building before they ran out of air. Most did not call a Mayday; all were declared nonsurvivors. The few that called a Mayday for themselves made the call outside the window of survivability.

- The Indianapolis (IN) Fire Department used a 2 1/2-story wood-frame residence charged with live smoke for departmentwide RIT training. Four-member RIT teams were activated to locate a trapped firefighter who had declared a Mayday.

Department Training Chief Doug Abernathy estimates there were 15 to 20 failures of the low-air warning system on the SCBAs worn by the rescuers. Many of the failures resulted in out-of-air situations. Other firefighters became separated from their partners. None of the rescuers called a Mayday for themselves. "We found that we have a long way to go with our RIT and Mayday training," Abernathy reported.

- Washington Township, a department adjacent to Indianapolis, recently tested 120 firefighters in a Mayday situation. Using a large, recently abandoned restaurant and blacked-out facepieces on the SCBAs, the firefighters were taken in one at a time. All, with the low-air warning already sounding, were told that they were members of the attack crew. It was further explained that they had become separated from the others. Individually, the firefighters were spun around, to disorient them, and positioned five feet from the charged handline. Training Officer Dale Strain explained that he hoped the firefighters would then declare a Mayday over the radio and activate the alarm on their PASS device. Strain reports that all but a few did one or both procedures; he attributed this success to the Mayday training the firefighters had recently received.

MAYDAY RULES

Firefighters start developing their RPD slide tray in rookie school. Hesitation, retreat, and call for help are not learned. With this in mind, how do we learn when to call a Mayday? Throughout your career you will most likely never need to call a Mayday. We cannot rely on experience to teach us this competency—the first time may be the last time. If there is a very important skill that you very rarely need to use and you have to do it right the first time, you must drill, drill, drill—drill your entire career. Jetfighter pilots review ejection doctrine before each takeoff, and they drill on it every two months.

We developed nine "Mayday Decision Parameters" to guide firefighters in deciding when to call a Mayday in a single-family dwelling fire.⁷ Individuals and small groups brainstormed to identify the specific parameters. The parameters were then submitted to sample populations of firefighters (339), to determine if they agreed or disagreed that they must call a Mayday under those conditions. These parameters are not conclusive and have not been field-tested. The nine conditions receiving the highest number of "agreements" among those surveyed that these conditions warrant calling a Mayday are presented to foster further discussion and study.

The parameters are as follows: (1) if you become tangled, pinned, or stuck and the low-air alarm activates; (2) if you fall through the roof; (3) if you become tangled, pinned, or stuck and do not extricate yourself in 60 seconds; (4) if you are caught in a flashover; (5) if you fall through the floor; (6) if there is zero visibility and no contact with the hose or lifeline and you do not know in which direction the exit is; (7) if your primary exit is blocked by fire or collapse and you are not at the secondary exit in 30 seconds; (8) if your low-air alarm is activated and you are not at an exit door or window in 30 seconds; and (9) if you cannot find the exit door or window in 60 seconds.

It would seem that firefighters intuitively would call a Mayday if they fell through the floor. However, when we asked 339 firefighters from many different fire departments if they would call a Mayday if they fell through the floor at a single-family dwelling fire under IDLH conditions, only 88 percent said they would. What are the other 12 percent going to do? Whatever it is, it is not the correct first decision.

Ninety-eight percent said they would call a Mayday if they were tangled, pinned, or stuck and their low-air alarm activated. That still leaves 2 percent who would not call a Mayday.

The Mayday condition with the lowest "yes" response was "Cannot find exit (door or window) in 60 seconds." Fifty-eight percent said they would call a Mayday; 42 percent said they would not. Remember, this fire example was in a single-family dwelling—front door, back door, and window in most rooms. We did not choose this dwelling or the exit Mayday condition by accident. When you review the National Institute of Occupational Safety and Health firefighter fatality reports for one- and two-family dwellings, the firefighter victims were very close to a window or exit door but still failed to get out in time. One minute (60 seconds) can be an eternity. Managing air and time in IDLH conditions are critical factors in Mayday decision making.

RECOMMENDATIONS

We encourage you to be creative and to address these issues by yourself, with your crew, with your department, and with your trainees and to implement training programs that incorporate these conditions and procedures for overcoming them.

Practice calling a Mayday over the radio. Blindfold the firefighters. Have them wear gloves; hand them the radio; and see if they can turn it on, get the correct channel, push the emergency identifier button, push the talk button, and verbally call a Mayday. Have someone on another portable radio serve as communications and receive the information: Who is calling? What is the problem? Where do you think you are?

Repeat the same drill in full turnout gear with SCBA in use. Put some mattresses on top of the firefighters. See if they can get the radio out of their pocket.

As the company officer, tell your crew when you expect them to call Mayday for themselves. Give

specific examples. Tell them when you will call a Mayday for them, giving specific examples such as under IDLH conditions or "if your leg falls through the floor and I cannot pull you out on the first try, I will call a Mayday" or "if the ceiling falls on us and we get tangled in wire, we will call a Mayday and then start cutting our way out."

At the training academy, every time you have live-fire training, place crew members in a situation in which they must make the Mayday decision for themselves. The instructor can drop a cargo net over a member or block the exit. Build a prop that drops the firefighter through a trap door into a ball pit. This will also create a drill in two in/two out and RIT. It will also desensitize the others on the operational team to the Mayday call so they continue fighting the fire instead of abandoning their assignment to go to the aid of the downed firefighter.

If we want RIT and Saving Our Own to work, we need to put the Mayday calling slide into every firefighter's RPD slide tray. Then, we need to drill on it often. Because RPD "... is predicated on people choosing a course of action based on pattern matching, a comparison of the current problem to similar problems encountered before." (4,74) We cannot rely on fireground experience to teach us when to call a Mayday; therefore, we must simulate this lifesaving skill often.

A sobering thought related to the issue of RIT and Mayday comes from Battalion Chief Kenny Freeman of the Fort Worth (TX) Fire Department: "Personally, perhaps the most important issue brought to light through the RIT training involves the realization that my expectations and assumptions concerning the deployment of a RIT team were both inaccurate and unrealistic. While my previous assumptions were totally born out of a commonly held perspective, they would have been nonetheless ineffective and possibly tragic in the final analysis."⁸

Rapid intervention teams and Saving Our Own training are wonderful firefighter survival tools. But, like all safety equipment or SOPs, the most important component is the firefighters themselves. Just as you have to put on your seatbelt to have it protect you in an accident, you have to call a Mayday for the RIT to come to get you out. Will you?

Endnotes

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Calling A Mayday: The Drill

Dr. Burton A. Clark

Calling a MAYDAY is a complicated cognitive, affective, and psychomotor skill set that relies on a radio and the communication system, both human and hardware, that gets the call for help.

Thanks to the cooperation of the Anne Arundel County Fire Department (AACOFD), the Maryland Fire Rescue Institute (MFRI), and the Laurel Volunteer Fire Department (LVFD) the firefighter MAYDAY concepts presented by Clark (2001, 2003) and Clark, Auch, & Angulo (2002, 2003) were put to the test and passed with high marks. The Mayday Doctrine theory is based on an analysis of the engineering, psychology, physiology, and training aspects of a firefighter calling a Mayday. This analysis used jet fighter pilot ejection doctrine models as the foundation (benchmark) for developing firefighter Mayday Doctrine.

Over a three-day period 91 firefighters and officers experienced what it may be like to call a MAYDAY using their cognitive, affective, and psychomotor skills. The overwhelming conclusion by all who participated was that everyone needs this type of training and it needs to be repeated throughout your time in the service. Battalion Chief Dave Berry of the Anne Arundel County Fire Department conducted the training for Battalion 3 on all three shifts. The drill consisted of classroom lecture and hands on practice. Each class size was about 15 students, two drills per day (AM and PM) six drill deliveries total.

Chief Berry used the mayday articles as the foundation for the lecture portion of the Battalion Drill, "Calling a MAYDAY." In addition he asked 110 firefighters "What Makes You Call a MAYDAY?" From this extensive list he narrowed the MAYDAY Parameters down to six words: Fall, Collapse, Activated (low air or PASS device), Caught, Lost, Trapped. To drive the need for Mayday training home, the Seattle, Washington Fire Department videotape of the three firefighter near misses was presented. This tape clearly illustrates how quickly a firefighter becomes incapable of calling the MAYDAY because of carbon monoxide that reduces cognitive decision-making and small motor skills and the psychological reluctance of firefighters to call for help. An additional videotape of the near LODD of an Anne Arundel County firefighter brought the point home that this can happen to you and you only get one chance to call MAYDAY correctly.

The most elaborate prop simulated falling through the floor. This prop was designed and built by Engineering Technician Donny Boyd of the MFRI. The prop consists of a ramp the firefighter crawls up. (photo 1) At the top is a teeter board, which when the firefighter crosses the center of gravity, tilts forward; (photo 2) dumping the firefighter into the third part of the prop, the ball pit. (photo 3) The ball pit is actually filled with cut up swim noodles because they were less expensive than balls and are more durable. A key concern was safety of the firefighter. No one was hurt but the firefighters knew that they had suddenly fallen into something. The transportable prop was build for under \$1000.00



Photo 1



Photo 2



Photo 3

The second prop, simulating a ceiling collapse, was made of chain link fencing that was dropped over the firefighters as they crawled under it. (photo 4) Two instructors then stood on the fence restricting the firefighters movement and making it impossible for them to escape.



Photo 4

The classroom lecture also covered the three AAFD procedures for calling a MAYDAY. First, push the emergency identifier button (EIB) on the radio. This captures the channel for 20 seconds, gives an open mike to the radio (in other words the firefighter does not need to push the talk button on the radio), and sends an emergency signal to radio communications identifying the radio. Second, announce MAYDAY, MAYDAY, MAYDAY. Third give LUNAR: L location, U unit number, N name, A assignment (What were you doing?), R resources (what do you need?). The classroom portion of the drill took about 90 minutes. Chief Berry distributed a job aid, the size of a business card, to all participants; it listed the six MAYDAY parameters on one side and the three procedures for calling a MAYDAY on the other side.

The hands on portion of the drill took place in the basement of the fire station. The MAYDAY props were set up before the drill and the area was placed off limits so no one knew what they were to experience. The four MAYDAY props simulated: falling through a floor, being pinned under a ceiling collapse, getting lost / trapped in room, and becoming stuck while exiting the structure.

The third prop was a small bathroom with a sink and toilet about 5x6 feet. (photo 5) A hose line with nozzle ended in this room. Once inside, the door was closed and a wooden chock placed under the door. This made it impossible for the firefighter to exit the room.



Photo 5

The fourth prop simulated becoming stuck while exiting a building. (photo 6) The prop was a piece of wire rope with a slip loop that was dropped over the firefighters SCBA bottle. As they continued crawling the loop tightened up making it impossible for them to move forward. Try as they may, they could not get loose. (photo 7)



Photo 6



Photo 7

One at a time the firefighters were brought to the outside basement entrance. They were in full turnout gear with SCBA. At the entry point they were given the assignment. "This is a simulated fire with IDLH conditions. You and an imaginary partner are to follow this attack line into the kitchen. When you arrive your assignment is ventilation." The firefighters were reminded of LUNAR, put on air and their face piece blacked out. The door was opened. They were told to go on hands and knees and follow the hose line.

The firefighters immediately had to crawl up the ramp (spotters were on either side), when the teeterboard tilted; they fell into the ball pit. The firefighters were expected to call a MAYDAY. If that was not their first reaction, the instructor prompted them, "What just happened to you?" Answer required, "I fell into something." Prompt, "What are you to do if you fall?" Answer required, "Call a MAYDAY." Prompt, "Correct, do it."

After the firefighters correctly pushed the EIB, said MAYDAY MAYDAY MAYDAY, and gave LUNAR they were told that they were done and were helped out of the ball pit. The instructor then reset the radio. They were told to go down on hands and knees again, crawl to another line, and continue their assignment. After crawling about 15 feet, the chain link fence was dropped on them. The instructors stood on the fence making it impossible to escape. Their correct response was to call a MAYDAY. If the firefighters struggled for more than a minute, they were prompted again. After calling the MAYDAY, they were released, their radio was reset, and they were told to continue their assignment. After another 15-foot crawl, they ended up in the bathroom at the nozzle; the door was chocked closed. This put them in the lost or trapped MAYDAY parameter. If after two minutes of trying to get out they did not call a MAYDAY, they were prompted. After the correct response, they were let out of the bathroom and the radio was reset. Next, they were told to find a nozzle on the floor outside the room they just left, then exit the building by following the line. The line took them around a metal fence/guard rail to a wheelchair ramp that led to the exit. As they turned the corner, a wire rope was dropped over the firefighter's SCBA bottle without their knowledge. After crawling 6 feet, the rope tightened, and they were stuck. After a minute of trying to get loose if they had not started to call the MAYDAY, they were prompted.

Lessons learned: At the first prop, most all the firefighters had to be prompted to call the MAYDAY. Their first instinct was to get out of what they had fallen into. The instructors did not let them get out. Their next challenge was pushing the EIB. This proved to be difficult for most of them and caused frustration and anxiety. The anxiety was evident by the increase in their breathing rate. The frustration was evident when some tried to remove a glove to find the button. Instructors did not allow this. They were prompted, "You just burned your hand. Put the glove back on." Most tried reaching down into the pocket to activate the EIB that usually proved unsuccessful. Some had to take the radio out of the radio pocket, in many cases this manipulation of the top of the radio caused them to change the radio channel. (photo 8) The longest time to successfully push the EIB was 2 minutes. Because of the frustration and anxiety, the LUNAR report was not always given correctly. The frustration and anxiety were most likely due to the fact that this seemingly simple skill of pushing the EIB was not easy. Pushing the emergency identifier button was challenging because the radio sat too far down in the radio pocket, gloved hands made it very difficult to activate the EIB, and the radio was a new style to the department.



Photo 8

At the second prop, the firefighters quickly realized they were not getting out of whatever had fallen on them, so few needed to be prompted to call the MAYDAY. This time restricted movement challenged them because the fence was all around them. Many had to remove the radio from the pocket. Since they had performed the EIB skill once before, they knew they could do it, so they just kept working at it. As the firefighter's EIB skill proficiency level increased, their LUNAR transmission was more accurate.

At the third prop there was no restriction on them physically. Many tried to break down the door; we did not let them do that. Most still had to remove the radio to activate the EIB. They gave LUNAR, but few reported that they were in a bathroom. Only one needed to be prompted to call the MAYDAY after about 2 minutes of just sitting in the room.

At the fourth prop, they were tired and quickly realized their forward movement was stopped. In most cases the "swim technique" did not reveal the rope, so they called a MAYDAY. Their LUNAR usually did not include the fact that they were now trying to exit the building they were still reporting "division one, kitchen, ventilation, trapped."

Only one firefighter was observed to have no difficulty pushing the EIB in the pocket; he even did it without lifting the pocket flap. During the second drill period, Firefighter J.B. Hovatter was observed having not put his radio down in the pocket. He had taught himself to put the pocket flap down inside the pocket and hook the radio clip over the chest strap of the SCBA. This technique positioned the radio halfway down in the pocket keeping the controls outside the pocket, but still securing the radio to the firefighter. He quickly activated the EIB every time. It was decided to teach this technique, "The Hovatter Method", to all remaining firefighters, whose performance level increased dramatically. (photo 9)



Photo 9

A discussion session was held with the class after each drill to show what the props were and to get feedback. Overwhelmingly, they said it was an important learning experience and they all agreed the drill should go department wide.

What some participants said: Division Chief Allen Williams, Health and Safety Officer for the AACOFD who observed the drills said: "Hopefully firefighters will do all they can to not need to call a MAYDAY. However, firefighting is dangerous and the risk is there. Firefighters are reluctant to call MAYDAY. The training forced them to call MAYDAY. The training was excellent. The training is a very good risk management strategy."

Battalion Chief Dave Berry said: "This training shocked them into calling a MAYDAY. It took some of the bravado out of them. It doesn't matter what rank you are we can all get into a situation where we need to call MAYDAY. The drill became the great equalizer. In training it is difficult to shock a person into calling MAYDAY without hurting them; these props can do that. I know now that my battalion can call a MAYDAY if they have to."

Captain Leroux said: "We needed to be coached through calling a MAYDAY; it did not come naturally. We had machismo and self-doubt. Should I or shouldn't I call MAYDAY, I'll be embarrassed. We learned how important it is to call MAYDAY quickly while you still can think and explain where you are and answer questions. It is my crew and I that go in and will be using this skill. When you get in a MAYDAY situation you are going to be so stressed out - calling MAYDAY has to come natural and this training will help."

A firefighter: "When they dropped that fence on me I realized I was done. You are calling people to come get you out. I had to concentrate on getting to the button and calling a MAYDAY."

Some veteran firefighters said, "It was the best training we have ever received in our career."

Lessons learned:

- For the MAYDAY call to be completed it must be received by someone in communications, then communications must repeat back to the firefighter the information reported. This is the only way the person calling the MAYDAY will know their message was received correctly.
 - The hands free feature of the radio is useful, but if the mike is turned facing the firefighter's coat the message will become muffled.
 - The firefighter must speak loudly, clearly, and distinctly to be heard and understood.
 - If LUNAR is not the normal day to day communications sequence for talking on the radio it may not come naturally to firefighters under MAYDAY conditions.
- In some cases the radio EIB did not reset correctly. The next time the EIB was pushed the three beeps sounded indicating the open mike was on but there was no transmission.
- It was learned that AACOFD communications could reactivate the captured channel and open the mike for an additional 20-seconds and repeat opening it as needed.
- The AACOFD is working on purchasing user-friendly firefighting gloves. This will help in using the radio.
- Situational awareness can be compromised very quickly in a zero visibility environment.
- The fact that you decided to call a MAYDAY can tax your higher cognitive thinking, like where you are and what you are doing, which are important facts for the RIC.

Calling a MAYDAY is a complicated cognitive, affective, and psychomotor skill set that relies on a radio and the communication system, both human and hardware, that gets the call for help. A failure in any component part of this system can be disastrous. We need to study, test, train, and drill the entire MAYDAY Calling system if we expect it to work when we need it.

Recommendations

First, practice calling MAYDAY. Can you push the EIB in 5 seconds with all you gear on? What happens when you push the EIB? (Does the radio channel change, who receives the EIB signal, where is it received, what do they do with the information?) Can you get to the radio when you are covered with debris? Where does the mike need to be so you can be heard? How loudly do you need to talk?

Second, include MAYDAY calling as a subset drill in all training where firefighters are put into simulated IDLH conditions. At a minimum, in rookie school and throughout their service, firefighters need to practice calling Mayday as often, if not more then, they practice-tying knots. Our bodies and minds need to be shocked into MAYDAY parameters repeatedly so the correct response becomes natural and instantaneous.

Third, get communications involved. How many times do dispatchers practice receiving and responding to a MAYDAY call? You do not want your real MAYDAY call to be the first time the radio operator gets to test their MAYDAY skills, radio equipment EIB function, and MAYDAY procedures.

Finally, whether you are the rookie firefighter or fire chief, if you put on SCBA and enter IDLH environments, you need to drill on "Calling a MAYDAY."