



A WILDLAND FIREFIGHTER FORUM FOR CHANGE

Safety Matters Forum Briefing

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Safety Matters: A Wildland Firefighter Forum for Change

Safety Matters a diverse group of retired federal wildland firefighters who are passionate advocates for wildland firefighter safety. We seek and encourage participation in this dialog with relevant feedback and suggestions from a wide audience including but not limited to:

- ❖ wildland firefighters
- ❖ fire managers and policy makers
- ❖ families and friends of wildland firefighters
- ❖ homeowners in the wildland urban interface

The purpose of this forum is to call attention to deficiencies in wildland firefighter safety presented by current wildland fire management systems. We encourage firefighters, the public, and their representatives to *support and demand* changes in policy and practices so that wildland firefighter and public safety is truly the **first priority** in all fire management actions.

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SAFETY MATTERS EXECUTIVE SUMMARY

June 2014

A year has passed since the deaths of 19 firefighters on the Yarnell Hill Fire in Arizona. Another fire season is now underway. The agencies managing wildland fire have not made any significant changes to existing procedures, nor have they announced any plans for procedural or policy updates for the future. This reflects the apparent perception that the existing system is working as well as can be expected. *Safety Matters* disagrees.

The mission of wildland firefighters has never been clearly stated or understood. The public, elected officials, agency managers and firefighters themselves not only interpret the mission differently, but their perception changes if the situation becomes dire. Firefighter and public safety is continually stated to be the highest priority by all agencies involved in wildland fire. *Safety Matters* does not believe this statement is always put into practice.

The following pages illustrate topics where we feel firefighter safety could not only be improved, but that this could largely be accomplished by changing existing procedures with potentially minimal cost. These topics are not intended to be the comprehensive fix, but instead highlight some of the existing safety deficiencies in the system.

Safety Matters has identified the following areas in need of immediate change, in order to provide for maximum firefighter safety. They include:

- ❖ A benefit analysis of values at risk (homes, private property, public lands) vs. the risk to firefighter's lives.
- ❖ Development of an independent investigative body for serious accidents and fatalities.
- ❖ Direct involvement of agency administrators and program managers, especially when fires escape initial attack and incident management teams are mobilizing or in transition.
- ❖ Establishing standardized emergency communications protocol.
- ❖ Establishing uniformity in mapping systems.

This report contains details and data to support these safety issues.

The 20-year anniversary for Colorado's South Canyon Fire is July 6, 2014. The Wildland Fire Lessons Learned Center was formed in response to the tragic 14 firefighter fatalities at the South Canyon Fire. The Center uses a Facilitated Learning Analysis approach to help firefighters make better decisions and improve their safety. While this approach has been beneficial, for all practical purposes it has been directed entirely at firefighters. When there is an incident involving firefighter fatalities, the general conclusion is that the decisions leading to the fatalities can be directly attributed to firefighters only.

Safety Matters feels that the lack of participation by management in the fire management decision process is a major failing in providing for firefighter safety. A majority of firefighter fatalities in the last 20 years have occurred after a fire has escaped initial attack and before a full incident management team has assumed management responsibilities for a fire. Given this situation we do not feel it is ever the sole responsibility of firefighters to assess the values at risk and determine the appropriate action. Investigations of firefighter fatalities due to burnovers or entrapments seldom look at management involvement, but rather focus on decisions made by the affected firefighters. It is time to quit blaming firefighters for the lack of management involvement.

We further believe that the current system tasked with protecting firefighters is seriously flawed. There are several National Wildfire Coordinating Group (NWCG) committees that are tasked with addressing the issue of firefighter safety, but there is no clear or obvious path for an identified problem to be brought forward and be addressed through a change in policy or procedure. Additionally, the current system staunchly supports the idea that only those within the system are qualified and experienced enough to provide credible input.

Safety Matters believes that the current approach needs to change both procedurally and behaviorally in order to truly make firefighter safety the first priority. A comprehensive review by a diverse and impartial group of experts would help clearly identify the shortcomings of the current system, and help craft a revised system that would best ensure that ***firefighter safety is the first priority.***

Wildland Fire Lessons Learned Center:

“A lesson learned is when we change our behavior”

20 YEARS OF WILDLAND FIREFIGHTER FATALITIES: AN INDEPENDENT STUDY

Background:

In order to get a more clear view of firefighter fatalities due to entrapment and burnover, we examined wildland fires from 1990 to through 2013 where journeyman firefighters have died. Journeyman firefighters are firefighters who:

- Have several seasons of firefighting
- Have attended all required training courses for the position they hold
- Have completed task books related to their position
- Are aware of or have participated in safety awareness programs such as 6 Minutes for Safety.

These firefighters have received the most current training and exposure to the safety programs developed and implemented in the wake of the 1990 Dude Fire in Arizona (6 firefighter fatalities) and 1994 South Canyon Fire. There may be inexperienced crew members involved in fatal burnover fires, but they are directly supervised by journeyman firefighters. Tactical decisions on these fires would have been made by journeyman firefighters.

We chose wildland fires from 1990 through 2013 because we felt that this timeframe would have firefighters who had worked in and been trained with the most current training, equipment, communication, strategies and tactics.

We started with an analysis of all firefighter fatalities that were attributed to entrapment and burnover based upon statistics from the National Interagency Fire Center (NIFC) website Historical Wildland Firefighter Fatality Reports. The initial results were 25 fires where 72 fatalities had occurred.

One of the first things that we noticed is that 61% of the fires involved journeyman firefighters. These are the type of firefighter that we did not initially think should be involved in fatal situation based upon their experience and training. We expanded our analysis to determine if there were common factors between fires where journeyman firefighters were dying.

We used professional experience and a review of investigation reports for each of the fires to identify factors that appear to be most common among fatal fires. The following table includes the factors that we identified.

Professional Firefighter Summary Data

- ❖ Eight fires with a total of 44 fatalities
- ❖ Fire Escaped Initial Attack - 100%
- ❖ Type III Incident - 75%
- ❖ Mountainous w/steep drainages - 100%
- ❖ Fire Danger Rating (Extreme or Very High) - 88%
- ❖ Brush a Major Component of Fuel - 100%
- ❖ Experienced an Exceptional Weather Event - 88%

44 firefighters died doing their jobs, all during extreme burning conditions.

Questions

- ❖ How many lives were directly saved by efforts of these 44 firefighters? We believe none.
- ❖ How many structures were directly saved by the efforts of these 44 firefighters? We believe none.
- ❖ How many "near misses" occurred during this time? We don't know.
- ❖ Why did 44 of the most highly trained and experienced firefighters perish in this manner if firefighter safety is truly our number one priority?

Safety Matters will be exploring some contributing factors.

PUTTING FIREFIGHTER FATALITIES INTO PERSPECTIVE

When compared with structural firefighters, career wildland firefighters die at a higher rate, and the rate is statistically significant. Career wildland firefighters make up only 5% of the total number of career firefighters in the United States. Ninety-five percent of career firefighting forces are structure firefighters. Based upon annual reports from the U.S. Fire Administration from 1994 through 2013, wildland firefighters make up approximately 27% of the total number of fatalities. There were a total of 859 fatalities, with 237 of these deaths being career wildland firefighters.

This represents wildland firefighters dying at a rate of 6 times higher than structure firefighters. (Volunteer and seasonal firefighters were not included in these statistics.)

While firefighter safety is considered to be the highest priority for structure and wildland fire, by its very nature structure fire appears to be more dangerous. Structure firefighters have jobs that include entering burning buildings – residential and commercial, rescuing and providing medical treatment to individuals who have been trapped and injured, and responding to hazardous materials fires. With some notable exceptions, wildland firefighters do not share these types of dangers and responsibilities. Wildland firefighters are trained to prevent the undesirable spread of wildland fires from the wildland into areas where fire can endanger lives, property and other identified values at risk.

While differences in types and duration of exposure experienced by wildland and structural firefighters can be endlessly debated, the questions that need to be answered are:

- ❖ Why are Wildland Firefighters dying at a significantly higher rate than Structure Firefighters?
- ❖ What are Structure Firefighters doing to help control the risks to their lives?
- ❖ Can similar safety measures be applied within Wildland Firefighting?

***And most importantly:
What are Wildland Firefighters protecting that is worth dying for?***

WILDLAND FIRE INVESTIGATIONS

All current investigations involving fatalities are mandated to determine the cause of the accident so that corrective actions can be taken. There are presently two types of investigations that result in the following outcomes:

- Land management agencies choose to use the findings to educate their employees to become more aware of the critical factors involved in fatal accidents. The goal is to enable employees to learn from and avoid future similar situations. This is the Learning Culture approach.
- OSHA or state authorized administrators of the federal agency (such as Arizona Division of Occupational Safety and Health) are legally bound to determine if policies, rules and/or regulations were not followed, issue citations based upon their determinations, and mandate changes to rules and/or regulations to avoid future accidents.

The land management approach generally works for non-fatal accidents and near-miss situations, but when a fatality occurs this approach appears inadequate. Most cases with fatalities will result in litigation. The determination of fault for the fatality will be decided on the basis of the investigation and litigation.

Some of the problems that can arise within and from the two separate investigation formats are:

- Investigations with different outcomes result in confusing messages being conveyed to wildland firefighters and the public.
- Conducting separate investigations results in redundancy and unnecessary expense.
- The specified time periods for investigations are sometimes as little as two months and usually not more than six months. Complex investigations are hindered by these time limits. Conclusions that would be more accurate and robust if additional time was allowed are not reached.

We believe that a National Transportation Safety Board (NTSB) model of accident investigation would better meet everyone's needs in investigating wildland fire fatalities. This approach would allow a single independent investigation of the accident by an impartial group of specialists. The advantage is that this model is not constrained by time, agency agendas or associated politics, or public pressures.

When the NTSB completes an investigation the findings are submitted to the involved agencies. These agencies use the report to meet their agency or corporate requirements. This approach also resolves the concern that mixed messages are transmitted to firefighters and the public.

AGENCY ADMINISTRATOR ROLES

Agency Administrator/Line Officer: *Managing officer of an agency, division thereof, or jurisdiction having statutory responsibility for incident mitigation and management. (ex: National Forest Supervisor, National Park Superintendent, BLM Field Office Manager, etc.).*

Firefighters and their agencies, the public and elected officials all agree that losing firefighters in the line of duty is truly unfortunate, and yet it is perfectly acceptable to expect firefighters to operate in positions that put their lives at risk. *Safety Matters* believes that this risk to firefighters can be greatly reduced by clearly defining the role and responsibility of Agency Administrators in evolving fires.

The field of wildland firefighting has greatly increased in complexity particularly over the last 20 years. Incident Command System position requirements now call for greater training including simulations, experience, and performance evaluation. Agency Administrators or line officers often do not have the option of the same intensified training, experience or performance evaluation prior to assuming the actual position. Agency Administrators or line officers are expected to make informed decisions that may put employees in life and death situations.

The Chief of the Forest Service has published his “Letter of Intent: 2014 Fire Management” direction in February 2014. The letter includes 9 fundamental principles and Ten Questions that must be answered.

The Ten Questions are related to the following statement: “sound decision making relies on identifying reasonable objectives for protection of critical values at risk, while considering the amount and quality of firefighter exposure and probability of success”.

Safety Matters believes that a clear understanding of the consequences of failure of each alternative is also needed. The agency administrator needs to set the parameters for monitoring and reevaluation during the incident. The need for leaders to participate in the development of a strategy and plan for managing escaped fires should be a requirement and not an option. This should hold true for any agency that has jurisdiction for a wildland fire, including federal, state and local agencies.

There is currently no requirement by the wildland fire community to enforce this. Should the responsibility for making these decisions be delegated as such, and does doing so compromise firefighter safety?

A complex analysis for the Agency Administrator can be accomplished preseason. Agency Administrators who fail to accomplish the preseason work may find themselves unprepared for the arrival of an Incident Management Team (IMT). Poorly prepared Agency Administrators may often attempt to push the responsibility onto the current or incoming Incident Commander instead. If an agency administrator fails to provide clear management direction and address alternatives, the subsequent decisions then fall on the Incident Commander.

This situation is compounded by the well-known fact that firefighters pride themselves in operating as a “can do” organization. Firefighters will step up when faced with risk and minimal support, by extending themselves to do their best. On the other hand, Agency Administrators may feel it is more prudent for them to “leave it to the firefighter experts” to determine the best alternative. Separation from the decision process may leave agency managers feeling less culpable should something go wrong.

This process has often been cut short and minimized due to time constraints, fire complexities and external factors. Most fires suppressed during initial attack will typically result in little if any negative consequence. Initial attack fire directives may be as simple as suppress the fire as quickly as possible, have an economical approach and be safe. But if the fire escapes initial attack, firefighters are often left with little additional guidance or direction, and are forced by necessity to make decisions on their own; decisions that should be made by the Agency Administrator with input from firefighters on scene.

With a rapidly expanding fire, the ability to transition to a more qualified management team is 24 hours away at best. This transition time has historically proven to be extremely dangerous to firefighters.

Many firefighter fatalities have occurred during these very circumstances.

Establishing a clear understanding between the Incident Commander and the Agency Administrator as to what constitutes an escape during initial attack is essential. If a fire escapes initial attack then the Agency Administrator should be required to reassess the alternatives and provide the Incident Commander with clear instruction as to current goals and objectives.

Failure to do so should mandate that all fire resources immediately disengage.

PROGRAM LEADERSHIP ROLES

Agency Program Manager: *Managing officer of an agency having responsibility for oversight, implementation, and development of the wildland fire management program.*
(ex: Fire Management Officer, NWCG, etc.)

Safety Matters believes that a lack of open and cohesive leadership is the foundation for problems that surround the ability to effectively address safety concerns in wildland firefighting. There is currently no clear way to identify and address safety concerns that effectively results in incorporated changes.

There are two primary areas that *Safety Matters* has identified as examples that show what we perceive to be a lack of open and cohesive leadership.

First, in 1957, after reviewing 16 tragedy fires a task force commissioned by the Chief of the USDA Forest Service Chief developed the original 10 Standard Firefighting Orders. Until recently these orders were considered inviolate. Today many crews and agencies still consider this to be true, but many others do not.

For better or worse, NWCG has taken the position that the 10 Standard Firefighting Orders are now to be considered guidelines and not absolute orders. No explanation has been issued by NWCG to explain why rules that have been in place for over 50 years are suddenly guidelines. If the official position of NWCG is that the Orders are simply guidelines, then what rules are in place for firefighters to follow? And what criteria will be used to evaluate future accidents to determine what went wrong and why? And why are the 10 Standard Firefighting Orders still being taught as rules? This situation will only be resolved with strong program leadership.

A second example is represented by fire in the Urban Interface. Wildland fire in the Urban Interface often represents a perfect firestorm. Competing interests of wildland firefighters, structural firefighters, residents, businesses, elected officials and law enforcement often come together under emergency conditions without the benefit of cohesive planning or practice in an attempt to prevent the loss of life and property. Homeowners have often done little to nothing to protect themselves from such an event. Firefighters on the ground typically work under the simple approach of “do the best you can.”

Before and during wildland urban interface fires, program leaders need to provide the leadership necessary to coordinate and resolve these issues or establish any rules, guidelines, limits or procedures for their personnel. In many areas this type of leadership either does not exist or it needs to be strengthened and reinforced.

Other examples of inadequate leadership include:

- ❖ Individual agencies sponsor research on differing firefighting topics, without a collective effort to identify or fund areas to improve firefighter safety. Adequate leadership should not only include an interagency collaboration on all aspects of firefighting, but should collectively prioritize firefighter safety as a united interagency effort.
- ❖ As wildland firefighting has evolved in the 20 years since the South Canyon Fire, firefighters receive far more training and information in order to effectively fight fires. The negative effect of this evolution is that under the banner of effectiveness, firefighters often prefer to work independently and view participation by others as interference. Program leaders, with notable exceptions, are content to let firefighter take this approach and are reluctant to provide the direction and leadership they are charged with providing. This only becomes readily evident after an accident.

Safety Matters believes that in many cases, current incentives for program leaders leads to a leadership vacuum. As long as program leaders appear to be doing the best they can with the resources they have, they are relatively immune to criticism. Criticism usually leads to a plea for resources and funding. Ground level firefighters receive the message that everyone is doing the best they can and occasionally very bad things will happen, and firefighters may be injured or killed in spite of it. The lack of significant public changes to wildland firefighting safety guidelines in the wake of the Yarnell Hill Fire of 2013 reinforces this message.

The message that firefighters really need to hear is that firefighter safety is truly the first priority and they will not be expected to risk their lives without proper program leadership.

Program leadership objectives are often geared to meet public and political expectations by putting the fire out as quickly and cost-effectively as possible. A firefighter's incentive is to meet the expectation of the program leadership, feel good about the job they have done, and earn some good money in the process. Firefighter safety is the stated first priority for both firefighters and program leadership, yet experience has shown that risks taken by both have resulted in unnecessary firefighter injuries and fatalities.

When program leadership clearly identifies the rules of engagement and disengagement for ground-level firefighters, and makes clear to firefighters and the public what these rules are, only then will firefighter safety truly be the first priority. *Safety Matters* believes that until this is put into place, there is a continued risk and likelihood for more unnecessary firefighter fatalities.

EMERGENCY COMMUNICATIONS

Numerous wildland firefighter investigations involving fatalities have identified communications as a significant contributing factor. While a need for better equipment is often cited, *Safety Matters* feels that there is an additional factor that must be addressed.

The wildland firefighting community does not have a formally established procedure for critical emergency communications. Other fields, such as law enforcement, structure fire and aviation have developed protocols designed to help them effectively, efficiently and safely manage critical emergency communications. A single word, such as “mayday” will trigger the implementation of a set of protocols that allows for an immediate assessment of the emergency. A determination is then made of which procedures will be implemented for an appropriate response.

The wildland firefighting environment is one where continual reassessment and adjustment to a changing environment is necessary. As a result, experienced individuals tend to approach changing conditions in a calm and confident manner. This works well until an emergency occurs. The lack of an established protocol has led to situations where individuals remain calm or appear calm until it is too late. In the case of the 2003 Cramer Fire in Idaho, the helitack crewmembers calmly and repeatedly inquired as to when the helicopter would return to pick them up. The crewmembers remained calm until they were overrun by the fire. Communications on the 2006 Esperanza Fire in California did not allow for the proper and timely reporting of the distress of the engine crew.

Currently, if emergency or potential emergency traffic needs to be transmitted, the protocol is to communicate directly with the affected firefighters either by radio or voice. In many cases, there appears to be no follow-up to ensure that the message has been received. This is a high-risk approach. For example, if notification of an imminent radical weather change is transmitted, there is presently no requirement that all firefighters in the affected area acknowledge receipt of the message. Firefighters not receiving the message are likely to continue implementing their assigned task without benefit of knowing about the approaching weather change.

Safety Matters feels that it is time to develop an emergency communication protocol for the wildland fire community. There needs to be a formalized “Mayday” protocol. This protocol should ensure that the channels are cleared of all radio traffic until emergency information is broadcast and receipt is acknowledged. In the event of a fireline emergency, radio traffic should cease until the extent of the emergency can be assessed. Everyone on the incident should clearly understand that there is an emergency, and that it is the top priority. Until the situation is resolved, radio traffic should either be moved to other channels or cease all together.

It's time for wildland firefighting to join the ranks of aviation and other emergency services with professional and standardized emergency communications.

SAFETY CONCERNS WITH MAPPING ISSUES

“Maps were the key pieces of intelligence that were needed early on, but many crews did not have them. Several respondents reported coming across new neighborhoods that were not on the outdated maps they had”:

From the Wildland Fire Lessons Learned Center publication entitled ***Initial Impressions Report: Southern California Fires 2007: What We Learned, How We Worked.***

Six years later, many of those working on the Yarnell Hill Fire were not issued maps either, including the doomed Granite Mountain Hotshot Crew. When the critical time came to determine their location, they could only confirm that they were on the south side of the fire. This was moments before the fire overtook the crew. If their exact location had been known, a retardant drop could have been made in an attempt to save the crew.

Firefighters are required to carry fire shelters for their safety in an emergency. There is currently no requirement that firefighters carry maps of a fire area, if for no other reason than the potential of an emergency.

Safety Matters suggests that improvement in the following areas could provide increased firefighter safety:

First, maps should be required for all relevant personnel assigned to the fireline. Current technology allows for maps to be made available electronically. Firefighters on the line should carry appropriate technology that allows them to download the most recent versions of maps of the fire area. Anyone with a GPS capable cell phone and a free app can quickly read their current location in terms of longitude and latitude to within a range that would be acceptable in the event of an emergency. In areas where technology and electricity is minimal, paper maps should be required. In emergency situations paper maps may be the safest option, as technology can fail, connections can be lost and electronic screens can freeze.

Second, a standard map system should be designated for the wildland fire community. There is currently no recognized map standard for the wildland fire community, even though a standard mapping grid system exists -- the U.S. National Grid (USNG). Currently, wildland firefighters use different mapping grid systems that include, but are not limited to Public Lands Survey (Township, Range, and Section), Universal Transverse Mercator (UTM) Coordinate System, Military Grid Reference System (MGRS), and longitude and latitude which may be expressed in either decimals or degrees/seconds.

The overall complexity of any situation can be further increased when degrees, minutes and seconds, their decimal equivalents, yards and meters are comingled. The USNG is already being used by the Department of Homeland Security FEMA, and the States of Florida and North Carolina for emergency operations.

The situation can be further complicated when aviation resources use longitude and latitude expressed in degrees and seconds, while Planning and Geographic Information Services (GIS) personnel may use longitude and latitude expressed in decimal units.

In conclusion, maps were identified as a significant problem in 2007, and while the 2013 Granite Mountain Hotshot Crew had communications, they were not provided with maps and were unable to relay their exact location.

Safety Matters is compelled to ask: Could these 19 firefighter fatalities have been safely prevented if the crew had been able to communicate their coordinates earlier? Maybe not, but this is one question that will continue to haunt the wildland firefighting community.

*****SAFETY MATTERS*****