FIRE SAFETY: UP IN SMOKE?

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The safety record of the 2000 fire season was a good one and a credit to firefighters. Ironically, this was due partly to the intensity of the fires. Aggressive tactics were clearly imprudent in the face of massive flame fronts and aberrant fire behavior. These conditions dictated (and justified) a conservative approach where firefighters spent less time in harm's way.

So the 2000 safety record was more a function of the fires themselves rather than any objective organizational changes that made the fireline a safer place. In fact, there remain inherent safety problems in wildland firefighting that go unaddressed and which make substantive safety reform impossible.

While a Forest Service employee, I investigated many of the entrapments that occurred in the past twenty plus years. In my early years as a firefighter I was told and believed that fire management provided safety fixes after "the ashes had settled." Because of that belief, I helped cover up the real causes of the fatalities on the Battlement Fire in 1976. I bit my tongue on many more, including South Canyon in 1994 and Sheppard Mountain in 1996, due to promised improvements. As the promises faded, I began to speak up at firefighter conferences because if fire safety is ever going to be "fixed," the real causes of fatalities, injuries and near misses must be clearly understood. If organizational safety practices and training are based on the "official records," which many times are not based on the facts, how effective can these practices be?

In this article I outline six areas in which firefighter safety has improved little, despite clear lessons like South Canyon.

<u>Lack of fire management support for human factors</u>.

When looking at the fatalities, accidents, near misses and unsafe actions, fire organizations historically have focused on physical causes and ignored mental and cultural causes – the human factors. The rule of thumb among safety experts in the military and private sector is that only 20 percent of the causal factors are physical, while 80 percent are mental or cultural. If safety is to be No.1, on the fireline why have wildland fire organizations suppressed or minimized the mental and cultural causes of accidents?

Recent examples where human factors (mental and cultural) aspects of accidents were largely ignored includes: (1) mediocre entrapment investigations, many of which involve cover-up's and misinformation (South Canyon, Shepard Mountain); (2) forcing human factor concerns to be removed from the 1998 Butler et al. report; (3) under funding then canceling the human factors effort at the Missoula Technology and Development Center (MTDC), including the human factors newsletter (USDI, 2000); (4) the Center for Lessons Learned at Marana tracks only physical causes (USDI, 2000); (5) the new incident reporting system tracks physical and equipment causes, but ignores human factors; (6)

failure to adopt Crew Resource Management (CRM) for firefighters after it was recognized nationally as a need that had the potential to reduce accidents and fatalities by 50 percent.

Why safety is not No. 1.

Safety has never has been No. 1 and may never be. What then are the behaviors that compete with safety? After many discussions with firefighters and 35 years in the fire organization, in my opinion they are in order of potency and priority:

1. Putting the fire out. We are a **can-do** organization. This is the most heavily reinforced behavior on the fireline and most likely the leading cause of fatalities. See South Canyon Fire (USDI, 1994) and Sadler Fire (USDI, 1999) for examples.
2. Financial concerns. Personal financial incentives, while necessary, too often bias firefighters to work to the point of mental and physical deterioration, making accidents more imminent. This is more likely a cause of injury and near misses than fatalities. Fire managers and Incident Management Teams often under spend to save money in initial fire outbreaks. This results in insufficient resources attacking the fire. This alone or in combination with factor No. 1 puts firefighters at risk and can lead to fatalities (South Canyon, 1994).
3. Self and/or crew image. Who am I and who are we if we fail to put out the fire? We love to discuss and take pride in what we do. We don't brag about the one that got away or the one we chose not to fight (but we should when it involves excessive risk, i.e. the Sadler Fire). Esprit de corps can turn into excessive risk, especially when the public, media, and politicians are watching (Weick, 1995).
4. Agency/ Fire Organization image. The argument here is similar to self and crew image. We strive to accomplish No. 1 so the image of all firefighters is enhanced. This factor is more potent when we try to minimize an agency's causal connections to fatalities such as BLM fire management on the South Canyon Fire (Maclean, 1999). Interagency cooperation is the reason cited for allowing BLM smokejumpers to use inherently more dangerous parachutes (ram-airs) on USFS lands when much safer parachutes are available (rounds). This factor, image before safety, can be a primary barrier to fire organizations becoming learning organizations. See Karl Weick's book: *Sensemaking in Organizations* and Peter Senge's *The Fifth Discipline.*
5. Safety. Here safety is the concern for self and others. For safety to move up the list firefighters and agencies must look more closely at the higher reinforced factors and how to reduce or neutralize their potency. Firefighters must learn to think more clearly and then take the relevant factors into account before committing to strategies and tactics. And they must mindfully review the associated risks, especially following changing fire behavior and weather conditions. See my related article *Mindful Of Safety* (2001) recommending the practice of mindfulness.

Failure to change. A reoccurring factor in many accidents and fatalities is the failure to change strategies and tactics when fire behavior changes. Incident Action Plans often are mindlessly followed and push others into unsafe, potentially life-threatening actions (Shepard Mountain Fire, 1996) even though the conditions they were based upon no longer exist. This factor is often more potent than No. 5.

No one can follow the 10 standard fire orders.

It is humanly impossible to follow the 10 Standard Fire Orders and still fight the fire. How did this come about? What do we mean when we say, "We don't bend them, we don't break them"? In discussing these issues with fire managers, they say the orders pertain to each and every firefighter-not just to the crew superintendent or the crew collectively. Since no one can follow them, it is not surprising that investigations into fatalities and accidents show some or all were violated. Using the 10 Standard Fire Orders and the 18 Situations that Shout Watchout is still SOP for wildland fire entrapment investigations (Sadler Fire, 1999) even though such methodology is considered archaic and much better methodologies exist (Munson, 2000).

What is a personal example? Look at order No. 5: "Obtain current information on fire status". The behavioral problem here is that as soon as you make any fire observation it becomes a static conceptual memory and a moment later it is no longer current. A picky detail? Not when you consider how your mind processes information. We make decisions on the past remembered fire behavior (concepts) rather than the current fire behavior. Normally the direct perception of the actual fire behavior is short circuited by the concept, which has only a fraction of the information of a direct perception (de Charms, 1998). Most of the time we are unaware of the conceptual substitution and the corresponding gaps in our perception. To learn more about the underlying psychology refer to Daniel Goleman's *Vital Lies, Simple Truths* and Karl Weick's *Sensemaking in Organizations*.

Now consider a management example. Whenever I hear a fire manager say we don't bend or break the 10 Standard Fire Orders, I issue them the challenge to identify which, if any, should never be broken. Their normal answer is all of them. But if I clarify, that the same fire order then becomes the basis for never engaging a fire and the basis for disengaging the fire if it can't be followed, they go strangely silent. To date I have not had a single Fire Order recommended by anyone, once the clarification and added contingency are stated. Clearly, fire management wants and enjoys a system where they can seldom be held accountable.

Most wildland fire entrapment investigations involve covering up evidence.

Often these actions are done deliberately but sometimes they are done out of ignorance. Why do we do this? Deliberate reasons include: (1) other organizations do it (such as structural fire departments, the military, etc.). (2) The agency will be sued if we don't. (3) Key individuals have

suffered enough. (4) The agency will look bad. (5) We'll correct the situation when "the ashes have settled," i.e., South Canyon IMRT effort. Cover-ups, involving ignorance, include: (1) sending untrained people to investigate the entrapment (a favorite of wildland agencies). (2) Don't send someone who is getting wise to all the ways to cover-up evidence (as happened to me after the South Canyon Fire). (3) Send interested parties as investigators (biased towards covering up) (USDI, 1994). (4) Send only people with firefighting expertise, as that is primarily what they will notice and report (no psychologist or sociologist allowed). (5) Removing evidence before the team arrives (another favorite). (6) Ineffective interviewing skills that lead to short, incomplete accounts, i.e., lack of sufficient detail to understand the underlying causes. We then report all the superficial old favorite causes and can recommend the perennial "back to the basics" (South Canyon Fire, USDI, 1994). If it's not reported, you don't have to fix it and can't be held responsible for similar future occurrences.

Active concern for safety is punished.

This is usually passive punishment (withholding something normal or positive). An example of passive punishment is when I was no longer allowed to go on entrapment investigations when I did not sign the South Canyon report. Sometimes punishment is subtle, like labeling safety recommendations and presentations as "Mickey Mouse." This safety attitude is very visible organizationally since safety is poorly positioned, funded and staffed at all levels of government showing it's true importance with top management.

We are a long way from becoming a learning organization.

Senge (1990) defined a learning organization as one "where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning how to learn together".

We will continue to put people at risk if we never learn from our mistakes. Multiple fatality reports, such as South Canyon, look all too similar to those generated as long as 40 years ago; a sure sign of management failure. A persistent and vital need identified as a remedial action for more than 40 years is an incident reporting system (similar to the airlines). If safety is to ever be No.1 why has such an easy remedial action taken so long to implement? The data generated by such an IRS would become a baseline for assessing if organizational changes reduce accident frequency. Both the incident reporting system and the need to become a learning organization were identified in the first human factor conference in Missoula (USDA, 1995) as well as the follow-up 1999 conference in Reno (USDI, 2000). Fire management has also been slow to implement Tri Data recommendations, which are a large part of what has been learned so far to make fire culture safer.

Summary

Currently the fire organization is not very proactive in making safety a major influence in strategies and tactics. Getting the job done, money and image concerns push firefighters into taking excessive risk. What is needed organizationally is truthful fire investigations, an honest reporting system that tracks physical, mental, cultural and social aspects of firefighting and a willingness to become a learning organization. If safety is ever to become No. 1 in the fire community then the fire community must be willing to spend more time, money and effort to make it No. 1. The fire community must get beyond its superficial practices like saying over and over again that safety is No. 1 without any true, longer-term, institutionalized commitment. Part of this commitment should involve adopting CRM throughout the organization, following-up on the Tri-Data contract recommendations and promoting clearer thinking through the practice of mindfulness.

References

Butler, B.; Bartlette, R.; Bradshaw, L.; Cohen, J.; Andrews, P.; Putnam, T.; Mangan, R.; *Fire Behavior Associated with the 1994 South canyon Fire on Storm King Mountain Colorado* (USDA-USFS-RMRS-RP#9) 1998.

De Charms, Christopher, *Two Views of Mind* (Ithaca, Snow Lion) 1998.

Goleman, Daniel, *Vital Lies, Simple Truths: the Psychology of Self Deception* (New York, Simon and Schuster) 1985.

Maclean, John, Fire On the Mountain: *The True Story of the South Canyon Fire* (New York, Morrow) 1999.

Munson, Steve, *Assessment Of Accident Investigation Methods For Wildland Firefighting Incidents By Case Study Method*, Masters Thesis, University of Montana (Missoula, Montana) 2000.

Putnam, Ted, *Mindful Of Safety*, short version:(Jackson, Wildfire) May/June, 2001 and long version:(tputnam@montana.com) 2001.

Senge, Peter, The Fifth Discipline: *The Art and Science of The Learning Organization*, (New York, Doubleday) 1990.

Tri Data Corporation, *Wildland Firefighter Safety Awareness Study: Phase III-Implementing Cultural Changer for Safety,* (Arlington, Tri Data) 1998.

USDA Forest Service. *Findings From the Wildland Firefighters Human Factors* Workshop, (Missoula, USFS-MTDC) 1995.

USDI Bureau of Land Management. *South Canyon Fire Investigation*, (Phoenix, USDI-BLM) 1994.

USDI Bureau of Land Management. *Sadler Fire Entrapment Investigation*, 1999. At www.blm.gov/fna/.

USDI National Park Service. *Human Factors Workshop* (Boise, USDI-NPS), 2000.

Weick, Karl E. *Sensemaking In Organizations* (Thousand Oaks, Sage Publications) 1995.

Weick, Karl E. *South Canyon Revisited: Lessons from High Reliability Organizations* in USDA, 1995.