Ahorn Fire
Fire Shelter Deployment
Facilitated Learning Analysis
July 28, 2007

Event

On July 28, at 1537 a Division Supervisor, assigned to Division Zulu deployed a fire shelter. The fire fighter had been positioned as a lookout on an unmanned division on the southern flank of the fire to observe several spot fires that had been burning for several days. Mid afternoon, fire behavior became more active as it had on previous afternoons. Later the fire fighter observed more extreme fire behavior and moved up escape route to previously identified safety zone. Later the fire fighter determined as a precaution it was appropriate to deploy and enter his fire shelter. The intense fire did not reach the fire fighter and he was in his shelter for eighteen minutes. He was not injured and was taken back to the incident command post.

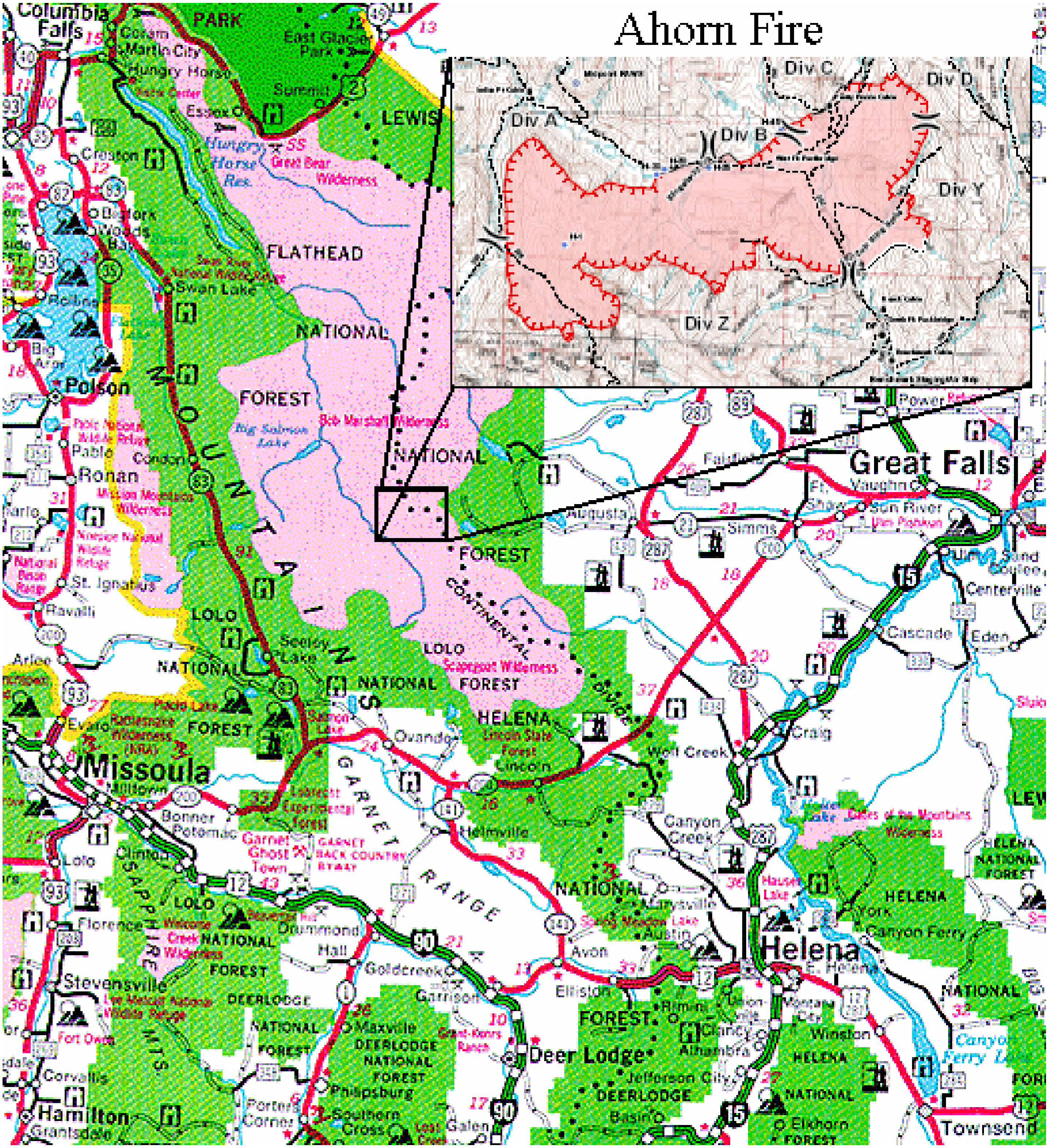
Fire behavior experienced in the Deer Creek drainage July 29th

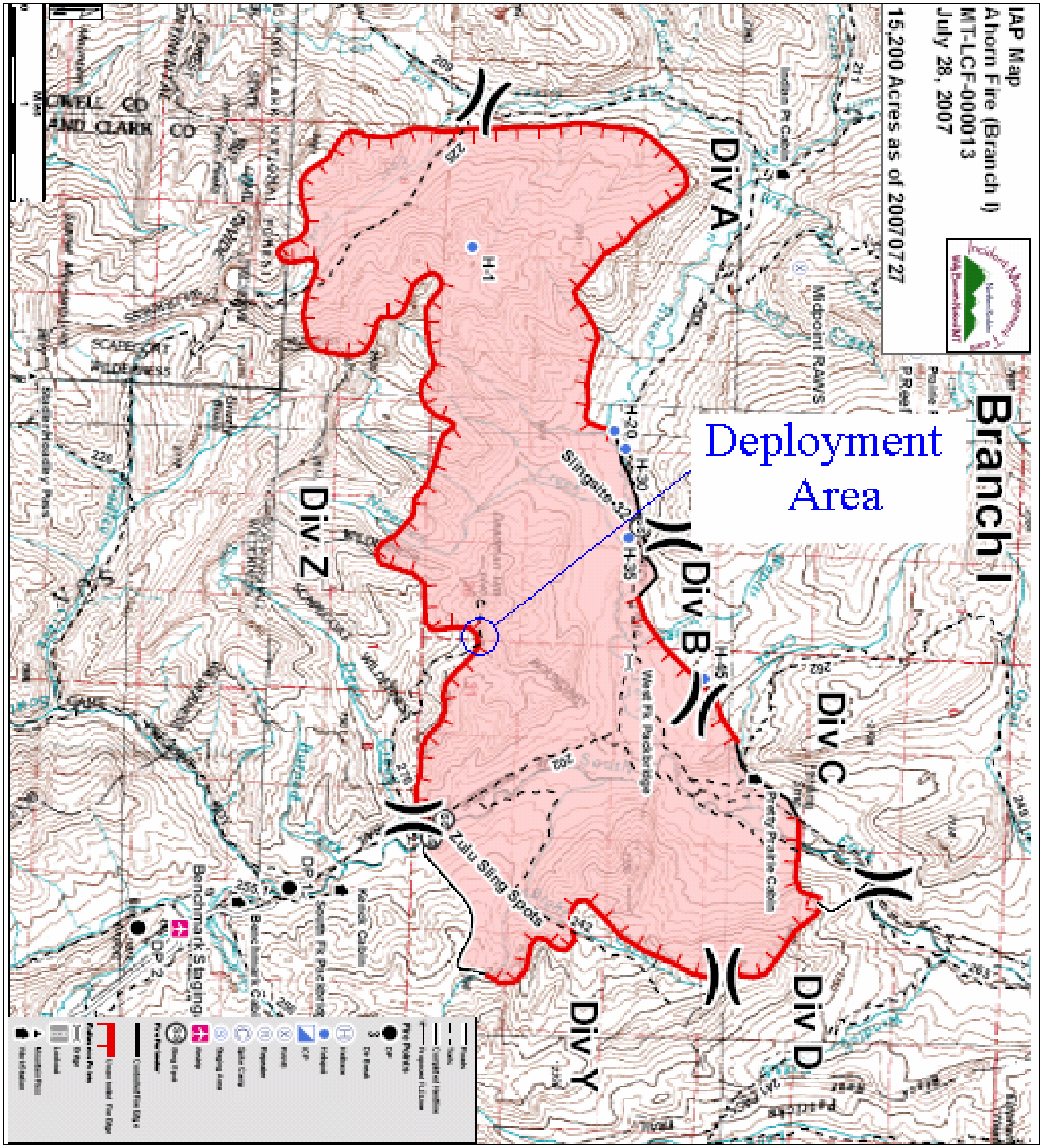
Facilitated Learning Analysis Process

Moving from "He/She Should", to "I Will"

As there were no serious injuries or likely claims to the agency, and there are no indicators of inappropriate or illegal actions, a Facilitated Learning Analysis (FLA) team was assigned to interview personnel central and peripheral to the deployment. The team identified opportunities to improve performance and also identified two strategies to disseminate findings to other firefighters.

FLA team members include: Tom Pettigrew, USFS Regional Office, Missoula
Paul Chamberlin, USFWS, AFD, Missoula
William Phillips, USFS, Smokejumper, Missoula
Robin Strathy, USFS, Lewis and Clark NF, Great Falls


Ahorn Fire
Div A
Div B
Div C
Div D
Div Y
Div Z
FLATHEAD
NATIONAL
FOREST
NATIONAL
FOREST
LOLO
NATIONAL
FOREST
HELENA
Great Falls
Missoula
Helena
Deer Lodge
Polson
Augusta
Simms
Ovando
Lincoln
Seeley Lake
Swan Lake
Hamilton
Stevensville
Townsend


IAP Map
Ahorn Fire (Branch I)
MT-LCF-000013
July 28, 2007
15,200 Acres as of 20070727
Branch I
Deployment Area
Div A
Div B
Div C
Div D
Div Y
Div Z

Salient Points

Whenever possible a Facilitated Learning Analysis utilizes the thoughts and words of firefighters. In this case, these corrective actions arise from the question "What can I / we do differently next time?"

- It is OK to deploy a fire shelter, and experience has shown it is better to deploy in a good spot sooner rather than later.
- Fire behavior in the Northern Rockies has exceeded any previous season, and consequently, a firefighter's image of an adequate safety zone may be too small.
- An Operations Section Chief (Ops Chief) said he has to be more specific when giving direction, and have the directions repeated back.
- In this case, the need to have anybody in this area had ended, but the question "Why stay?" was not asked.
- Individuals working alone have a responsibility to maintain a lookout and check-in schedule.
- Radio channels are often overloaded, and we are not challenging the system to provide an adequate communications infrastructure.
- Lookout towers can be a valuable asset to a wildfire organization but must be managed and integrated appropriately.
- Fire Shelter deployment training should reflect real conditions whenever possible, including donning gloves if your position does not require having gloves on already.
- Firefighters must remember to obtain fusees when arriving after a commercial airline flight.

Information Dissemination Strategy

"If timely, candid information generated by knowledgeable people is available and disseminated, an informed culture becomes a learning culture." Weick and Sutcliffe 2001

- A written narrative will provide details for reading, as well as a script for a sand table story-telling exercise. Discussion questions and slides will reinforce the sand table.

- A Safety Assistance Teams will present the sand table to field units.

- The report will be available on the Wildland Fire Lessons Learned Center web site.

- An Alert will be prepared emphasizing the critical nature of the fire behavior, and this season's changing definition of a safety zone. This will include dramatic photographs and video, and narration by the chief of the Forest Service.

Fire Behavior at the time of Entrapment

Deployment site; Fire shelter is the silver spot on photo; Actual deployment site circled in red; the fire did not burn all the way to the deployment site.

Narrative

The Ahorn deployment narrative will be presented in the 'After Action Review' format of 'What was planned?' 'What actually happened? 'Why did it happen?' And 'What will we do differently next time?' Readers will be able to follow the pertinent elements of the story while becoming involved with the lessons learned. The narrative, supported with projected slides and video interview, is also intended to support a sand table exercise as a tool to study and learn from this near miss.

What was planned?

The Ahorn Fire exhibited extreme fire behavior since the beginning on July 11. The initial attack smokejumpers retreated to safety zones, and then moved to better safety zones as the situation became apparent. The experience of the jumpers was well communicated to the Incident Management Team and alerts had been well circulated. The Type 1 Incident Management Team assumed command on July 19, and knew from the start Ahorn would be a long duration event. The strategy was to work the flanks and narrow the fire spread as much a possible. If luck was on their side, they may be able to pinch off the head of the fire. Otherwise, if and when a wind event occurred, the fire would spread from a narrow point and not a head several miles wide. On the day of the deployment, three Divisions on the north flank worked directly on the fires edge. Division Zulu and Yankee were on the south flank.

Fire behavior experienced in the Deer Creek drainage July 29th

Division Yankee presented opportunities for direct suppression; however the Ops Chief had reservations about staffing Division Zulu. Branch A and Branch Trainee thought Zulu could be staffed, and Ops Chief insisted they personally walk the area before they committed firefighters. After flying to the area Branch and Branch Trainee agreed the terrain was too difficult, particularly when the extreme fire behavior was considered. Incidentally, they departed the helicopter near the deployment site.

Fire behavior in the Deer Creek drainage in the early afternoon of the 27th. Photo was taken in the safety zone.

DIV/SUP Zulu, a firefighter properly qualified and experience in western firefighting, arrived in Montana from his home state in the mid-west. DIV/SUP Zulu was described as smart and eager to do a good job. On July 27 he and a Hotshot Crew Sup hiked into the area and agreed the area later used as a safety zone was a good one. Below this area were thick timber fuels with numerous spot fires outside the apparent fire perimeter. Each afternoon the fire behavior in this pocket increased.

What actually happened?

On the day of the shelter deployment, the Ops Chief tasked DIV/SUP Zulu with monitoring the fires in the thick timber, and be ready to direct water dropping helicopters when they became available. DIV/SUP Zulu hiked a second time (2 ½ to 3 hour walk) to the area above the spots, and felt the short escape route and safety zone were appropriate for this situation.

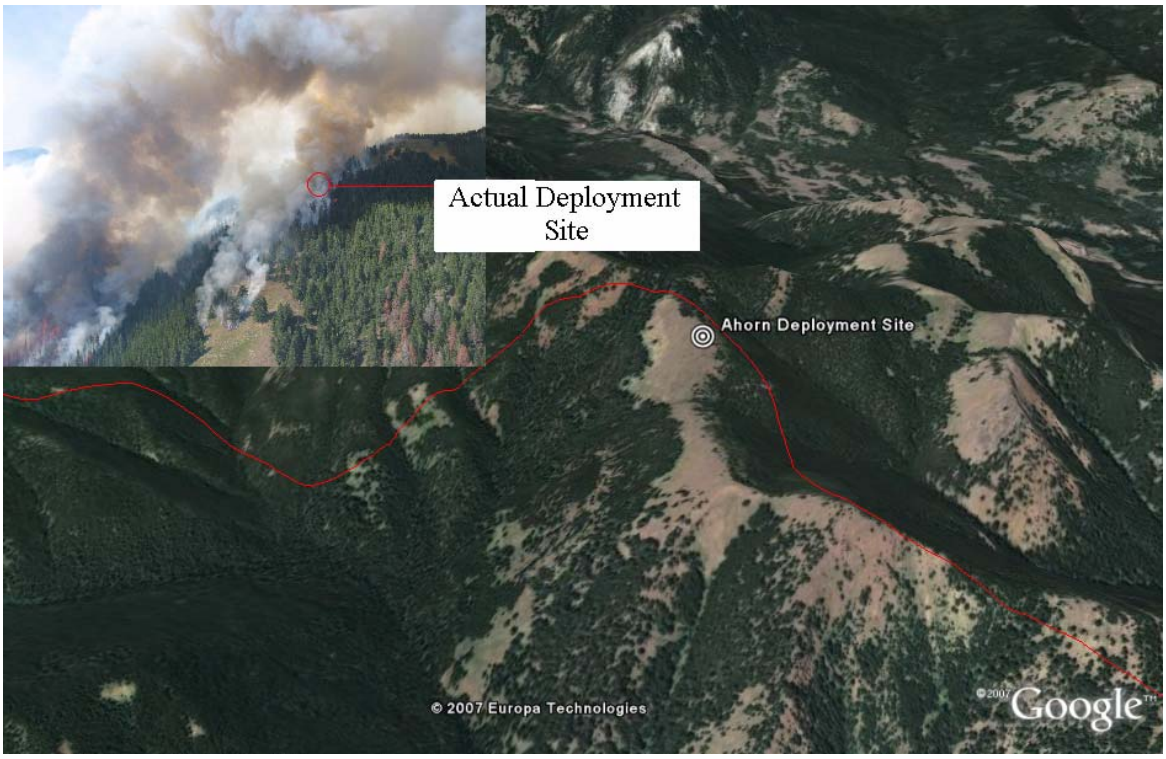
Fire behavior in the Deer Creek drainage close to the time of deployment on July 27th. Photo was taken in the safety zone.

Knowing DIV/SUP Zulu was from out of state, and wanting to reassure himself he was suitable for the job, Ops Chief made a point of having dinner with DIV/Sup Zulu. Having said that, the Ops Chief has an expectation that the system will provide only qualified and skilled personnel for assigned positions. The Ops Chief envisioned DIV/SUP Zulu walking up the trail and watching from below the spots.

Communications with Div/SUP Zulu was hit and miss all day, and changes in the communication plan were not clear him. Even though the Incident Action Plan indicated Division Zulu would not be staffed, the Air Attack called for a check, and was surprised when DIV/Sup Zulu answered. Patrol Peak Lookout was staffed with a 'walking wounded' firefighter who made a point of checking in occasionally; however there was no check-in plan agreed to. DIV/SUP Y and his trainee were somewhat aware of DIV/SUP Zulu; although they later lost track of him, as their tactical channels were different from each other. Mid-day DIV/SUP Zulu was told by Air Attack that there were more important priorities for the helicopter buckets, and he will not be getting any.

Fire behavior increased as expected through the early afternoon. From 1300 to 1500 Patrol Lookout reported fire behavior becoming more and more intense. It became so severe DIV/SUP Zulu determined it was time to retreat up to the safety zone. Once there, he again felt he was in a good place. Patrol Lookout recorded open flame and crown runs at 1530, and then the fire really did kick up with heat and smoke pouring over the safety zone. DIV/SUP Zulu stayed calm, and thought that if the fire intensity became more intense he will have wished he had deployed his shelter sooner. With that, he deployed his shelter, and radioed that he had done so. DIV/SUP Zulu is an average sized man, and felt the shelter was somewhat short. While in the shelter he began to get warm, but felt

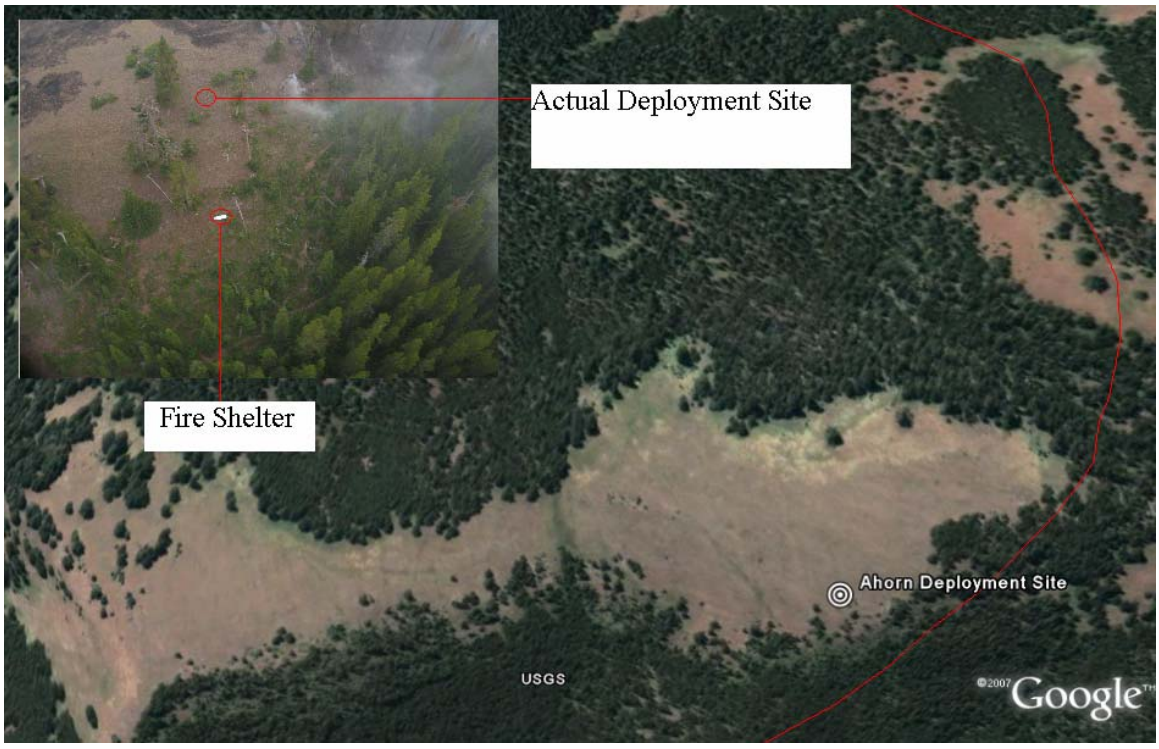
that was from his own body heat in the confined space. Dehydration became his concern, and he had to crawl to his shelter over to his pack to retrieve his 'hydration system'. Intense heat never reached him, but he realized he had neglected to don his gloves.



Google Earth rendition of topography around the safety zone and placement of the deployment site.
Photo of fire behavior during the deployment.

People monitoring their radios thought they heard something about a shelter deployment, and three people attempted to contact DIV/SUP Zulu and ensure his safety. Radio communications was sketchy, but adjacent forces began preparing for a medical rescue. Fortunately no rescue was necessary, and soon Ops Chief and Branch engaged, and arranged to have DIV/SUP Zulu picked up with a helicopter. Air Attack also came back to assist, and coordinated the air show.

DIV/SUP Zulu was apologetic (even on the radio) for causing a fuss, and knew an investigation would ensue. Team members and adjacent forces assured him that his health and safety was by far the first priority.



Google Earth rendition of topography around the safety zone and placement of the deployment site.
Photo of fire shelter deployment site.

Why did it happen?

It is hard to identify one reason this near miss occurred; however the analysis revealed numerous conditions that may or may not have prevented the close call. All of these factors fall well within the realm of 'normal' human error, the type of oversights and miscommunications we are all capable of.

- Identifying safety zones remains a critical task, and the multitude of variables makes simplistic parameters impossible. The important point here is the size appropriate last year is most likely inadequate this year; the fire behavior is just not typical.

- As mentioned above, the Ops Chief thinks it happened because the DIV/SUP Zulu was above the fire. While fire behavior experienced remained benign, fire behavior experience at other times at different places may not have been survivable, at this site, even in a shelter.

- DIV/SUP Zulu had the ES from LCES established; however a clear relationship and communications with a lookout was not established. Besides the risk of entrapment, any of us working alone must do what we can to stay accounted for.

- In the heat of the moment, the DIV/SUP did not put his gloves on.

- Radio frequencies were overloaded all day, everyday. Crews conducting business competed with lookouts checking in and relaying weather and fire behavior information.

- Once the helicopter became unavailable, there was no good reason to be above this fire. Even is there is a compelling reason, LCES and other mitigations must be adequate to guarantee firefighter safety.

- It was the shelter deployment that triggered the Facilitated Learning Analysis. In this case, far worse or more dangerous situations (such as DIV/SUP Zulu bolting through continuous fuels) could have occurred, but not trigger an attempt to learn.

What can I / we do differently next time?

- ***Safety zone size-*** Firefighters and line overhead are adamant that their previous sense of a good safety zone is inadequate. They report that not only does size matter, but position on the slope. The likelihood of fires washing up and over, flowing like a wave is greater that ever. The most common comment is they need to be thinking ahead, and ask where will this fire be in 20 minutes?; where will I be in twenty minutes?, and what will our situation be if I have underestimated the fire intensity?

- ***Ensure directions are clear-*** The Ops Chief said he needs to be much more specific when he gives direction, and take steps to ensure the image his subordinates have is the same as his. (See 'Two Way Briefings' in the Appendix)

- ***Having a designated lookout-*** DIV/SUP Zulu said he had several ways to ensure someone knew exactly where he was, and have a more specific relationship with a lookout. In this case, the lookout or DIV/SUP in Yankee would suffice, or the firefighter stationed on Patrol Mountain could be incorporated into the plan. In addition, a second firefighter could be assigned to accompany him.

- ***No gloves during deployment-*** DIV/SUP Zulu pointed out that in his unit back home, shelter deployment training often occurred in training rooms, or out on the grass. He will be going home to ensure training is as realistic as possible (DO NOT USE LIVE FIRE!!!), and details such as using packs and putting on hard hats and gloves is practiced to make that behavior automatic.

- ***Radio issues-*** Besides the systemic and well known radio infrastructure radio issues (i.e. limited frequencies, narrow-band / digital transition, communications with local cooperators, etc.) changes in the Frequency Plan in the Incident Action Plan were not well understood. This led to confusion. DIV/SUP Zulu said they

need to be more engaged with the frequency plan before committing to the field. (See Radio Vision Appendix)

- ***Is the plan still valid?-*** DIV/SUP Zulu looks back and wonders why he stayed above the fire when the helicopter bucket operation ceased to be an option. Most of the individuals interviewed said they will be paying closer attention to the effectiveness of their mission, and do a better risk / benefit analysis.

- ***Maximizing learning opportunities***- DIV/SUP Zulu recognized his safety zone as his best option. In hind site, the safety zone served him well; however the fear of an investigation was on his mind as he deployed his shelter. The analysis team recognizes DIV/SUP Zulu could have run down hill at the last minute, or some other unsafe act, yet there would be no trigger to initiate a learning analysis. We will be working towards a culture that trusts and expects learning culture activities.

Discussion Points

The following points should come up during a sand table or PowerPoint presentation. Leading questions may guide the discussion to ensure these are covered.

- It is OK to use a fire shelter sooner instead of later- IN AN APPROPRIATE SITE

- The size of safety zones is determined by the actual fire flame length and number of resources. Choosing a safety zone must be based not only on expected fire behavior, but must also consider unexpected fire behavior.

- Utilize a communication style that seeks feedback, or repeat-back, to ensure your image is the same as your co-workers.

- Everyone must be accounted for at all times. Think about who knows you are missing if an accident occurs, and keep that person informed.

- What definitive trigger points could have been set for this situation?

- Each firefighter needs to have their relationship with a designated lookout as a top priority.

- Shelter deployment training must include details including donning gloves, effect of winds, etc.

- Ensure detailed familiarity with the radio system and communications plan. Identify trigger points for the level of communications you will not go below. (i.e. every firefighter must have quality LCES, and we must be able to evacuate a sick or injured firefighter)

- If the plan becomes obsolete, focus on the commanders intent and overall objectives, and while coordinating with your superiors whenever possible, speak-up if the mission no longer makes sense.

- Do firefighters welcome or value a learning process such as the FLA? Is there a way to better approach people involved with a near miss?

Pyrocumulus formation caused by active fire behavior on the Ahorn Fire on July 28th.

Appendix A

Two Way Briefings

A model to ensure information is communicated

Paul Chamberlin, AFD, Missoula

'Give Clear Instructions and Ensure They are Understood' describes the problem. Wildfire suppression agencies pay close attention to briefing quality, and sometimes provide public speaking training and coaches. However, even the best presenters do not really know if their message has reached everyone, or if a supervisor's message is the same message remembered by their audience.

The supervisor, as articulate and thorough as he/she may be, waxes eloquently, and the recipient, looking in their eyes, nods their head in agreement. But, does the message really get delivered? All we can be sure of is the recipient can nod their head. We don't know if they even speak English.

Consider a 'Two Way Briefing Model' model. Knowing we are about to entrust many lives, expensive equipment, and the success of the plan to someone we have just met, Two Way Briefings communicate the objectives, or commanders intent, gains commitment to the plan, promotes individual empowerment, and assesses subordinate's skills. Here's how:

> Instead of explaining the nut and bolt details of a plan, begin by sharing the objectives; something like "I think you can hold the fire on this ridge." And then let them know what resources are available: "To do that you are getting these resources." And then, turn the tables and ask "How do you plan on pulling this off?" Now the hard part: Shut up and listen carefully. If they do not begin by identifying the best locations for lookouts, the options for safety zones, the difficulties for escape routes or communications, you know they will need close monitoring and even coaching. On the other hand, if the LCES details are well represented, and their plan makes complete sense to you, chances are this is a subordinate you will trust.

Two Way Briefings empower subordinates; it benefits from insights and talents of the subordinate, and actually makes the job of the supervisor easier. Many people prefer to work in this objectives driven environment, responsible for details, with an engaged knowledgeable supervisor.

Appendix B

Incident Communications Structure

William A. Phillips – Missoula Smokejumpers

Summary: Communication frequencies on large incidents need to better reflect a dynamic and changing event, incorporate incident ICS structure, and provide more open communication for the safety of all incident personnel.

Proposal:
Current communications follow a general structure for ground personnel: tactical, command (using repeaters), district simplex/repeaters (to reach forest personnel), air to ground, and emergency air guard frequencies. Usually, a division on an incident will have a single tactical frequency for all operations on that division. As incidents become larger and more complex, a single tactical (tac) frequency is typically not enough to allow adequate communications between many personnel on one division.

Every firefighter with a programmable radio has the ability to communicate on all channels. Command channels however, are reserved for pertinent information going up the chain of command at the division supervisor level and above (unless there are areas on a division that can not be reached without a repeater).

Transmitting messages in a timely manner is the most common problem encountered with a division on a single tac. The ability for leadership, including single resource bosses, strike team leaders, taskforce leaders, and division supervisors to communicate pertinent fire information involving tactical assignments, weather briefings, incoming air resources, logistical needs, and calls to pull out once trigger points are reached, is very important.

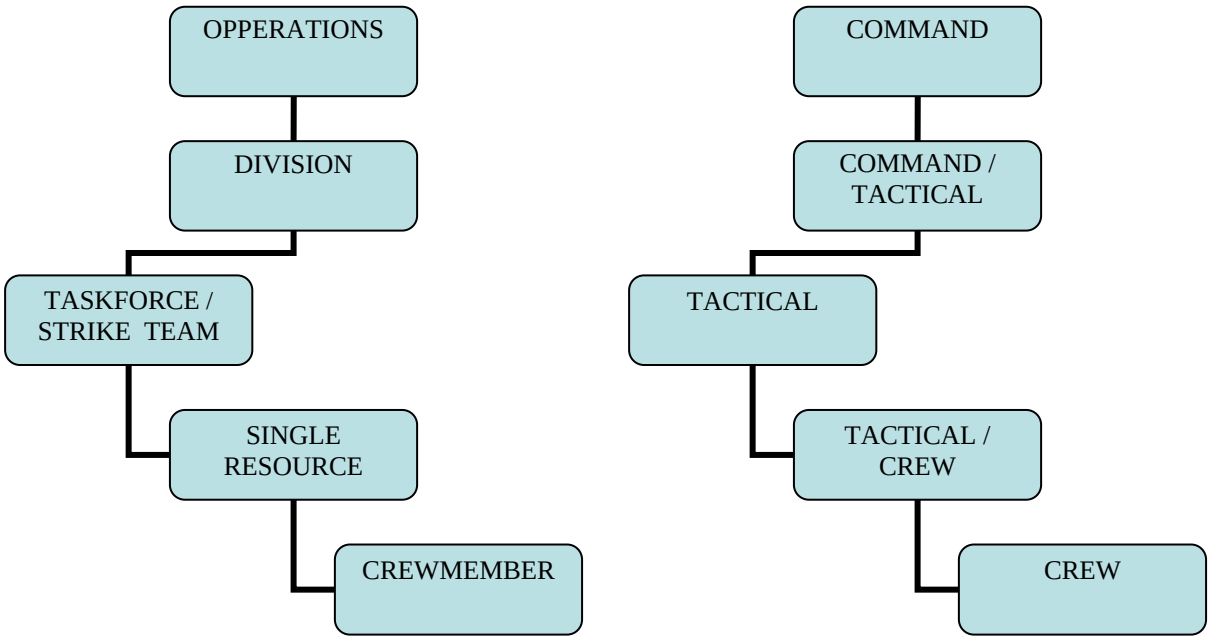
Crew personnel have a very similar need to communicate on a channel. Crew communications include locating personnel, fire behavior, LCES changes, weather, and tactical/logistical needs. These communications in general tend to tie up tac channels.

A possible solution includes “crew” frequencies for *all* crews, thus allowing adequate communications at this level while freeing up the tac channel for divisional leadership exchanges. Another possible solution would be a “team” channel system and having strike team, or taskforce communications on that frequency. Combining team and crew channels allows additional flexibility.

While more frequencies appear on the communications plan, it is not complicated. Firefighters will have the type of communications that provides for firefighter safety, supports task accomplishment, and better reflect our current ICS structure.

ALTERNATIVE 1

ICS STRUCTURE → → → COMMUNICATIONS SRUCTURE



ALTERNATIVE 2