

APPENDIX C: HUMAN FACTORS

If we look at and consider Foundational Doctrine Guiding Fire Suppression we note key concepts specific to fire suppression:

- No resource is worth loss of human life
- There are inherent risks in fire suppression
- Manage risk aggressively
- The intent of firefighting is to protect human life, property and at risk lands and resources
- Demonstrated fitness for command for leadership
- Use clearly defined, decisive, obtainable objectives
- Using principles requires judgment
- High capability for initial attack is essential

Perhaps the following Risk Management statement captures the above tension between risk and action “We practice risk management to minimize the exposures and effects of the inherent hazards in fire suppression, while maximizing the opportunities to achieve leader intent.”

Foundational Doctrine gives organizational guidance to a fire culture which is populated by individual fire fighters, leaders and managers. Upstream from organizations, cultures and people are human minds. When we quote the internationally recognized finding that human error accounts for 80% of all accidents and fatalities we are referring to errors made by those minds. Upstream of errors are minds.

To promote an understanding of the relevancy of human factors during the Alabaugh Canyon Fire requires an investigative process that promotes a joint willingness by involved firefighters and investigators to identify mental process occurring during the incident. To accomplish this goal, investigators must establish mutual trust with those being interviewed. This is necessitated by an awareness that mental processes are subtle and subjective, thus far more difficult to retrieve and document compared to physical phenomena. Determining mental processes involves interplay between art and science.

Firefighters interviewed were encouraged to account for events prior, during and after the entrapment in their own words from beginning to end without interruption. They were encouraged to include observations, thoughts, feelings, expectations, concerns and frustrations. These initial accounts took between 20-40 minutes. Next, interviewers asked specific questions to further prompt firefighters to recall mental and physical events. We then asked for their suggestions for changes to prevent a similar future occurrence and what they learned personally. Many were asked for their observations on the interview process itself. This lengthy interview process is necessary to get at the underlying subtle mental causes of accidents. What follows are their observations that help to understand human factors by noting what they were attending to as they made decisions during the incident.

It is useful to point out briefly how our minds work. We can attend to only one object at a time. While we attend to one object, all other objects are excluded from awareness. In essence we cannot multi-task, we only have the illusion of being able to do so. An alternate way to say this is

that attention to objects proceeds in a linear manner, one after the other. We can change attention many times per second giving us the perception of seeing and hearing at the same time. Fire fighters should learn to skillfully guide their own mental processes to stay focused in risky environments. Accident investigators normally look at “bad” events by focusing on incorrect actions, flawed decisions and inaccurate perceptions, even though such “flaws” were not influential or obvious to the involved firefighters. Rather than focusing on what wasn’t attended to (Esperanza Fire Report), it is more informative to focus on what the firefighters themselves focused on.

NARRATIVE: for Engines 663 and 664; Operations Section Chief Type 3 (OSC3) and Division Supervisor (DIVS)

Decision Point (DP)

July 7, 2007

0800 - The day started with Physical Training and the Daily Briefings with a Weather Watch in effect. We had high expectations of getting out on a fire today. We were advised to treat today as a “Red Flag Day” all day long. Later in the day a Red Flag warning was posted.

During the day thunderstorms were active, temperatures up to 105, and increasing expectations for a fire assignment. Fire fighters were eager to get out and “do something”.

2000 - A dispatch came in from the Alabaugh Canyon Fire.

2100 - We were dispatched to the Alabaugh Canyon Fire with darkness approaching.

The regular Engine Captain for one engine does not accept the assignment because he's going to a new job and has committed to spend this night with his family. An alternate Engine Captain accepts the assignment.

***DP:** A last minute leadership switch is a Human Factors heads up. Even though the new engine captain may be highly skilled and known by the other crew members the crew may be less cohesive than it has been. The involved crew members have a couple of hours driving together to improve cohesiveness.*

2230 - When the engines arrive at Hot Springs they observe an impressive column and many glows in the dark with thick black smoke above them.

2230 - At the Highway 71 staging area Division B Supervisor (DIVS) is assigned. DIVS asks for a map, but none are available.

2300 - When they stop in the staging area at Flyway Road and Highway 71 the two engines are assigned to Division B at DIVS’s request. An unassigned Division Supervisor (the future OSC3) arrives after scouting out the fire and discusses his observations.

2310 - The ICT3 briefs resources.

2320 - The fire fighters leave the Highway 71 staging area to go to the first house assignment at the Flyway Road Safety Zone.

2330 - When we arrive at the Flyway Road Safety Zone, there are dozers and scrapers constructing a safety zone.

2347 - Before we could engage in structure protection it started to rain sparks. The fire roars out of the canyon and “slams us hard”. One spot fire starts to grow but no resources move to suppress it. This is strange with so many resources nearby. We were asked to prep the torches for a burnout but the order was cancelled minutes later due to the spot fire’s rate of spread. Since this spot fire crosses the main containment road we planned to burnout from, the entire Division B strategy at this location is now compromised. We were then ordered to pull out and leave this area and head south towards the next structure and wait for further orders. The future OSC3 who is unfamiliar with the immediate area asks DIVS who is more familiar with the area to ride with him. One of the engine captains is asked to drive the DIVS vehicle for now. The future OSC3 and DIVS leave the home and safety zone at this location looking for the next place to use the engines and a place for a new anchor to use the hand crews and other resources.

We are observing extreme fire behavior everywhere. Many resources are idle because fire conditions are too erratic and extreme for hand suppression crews to be safely and efficiently deployed. These resources stay idle in the safety zone, which was just constructed awaiting the next plan.

There was so much radio traffic the channels were clogged. “I could hear a guy talking on there (the radio) about how the area that they were protecting was pretty much threatened by the front of the fire and that they couldn’t hold it any longer and that they were going to go ahead and pull out. They were then told to burn out another section.”

As we leave we continue to discuss fuels, structures, escape routes and safety zones. All the time there was extreme fire behavior all around us; “Fires burning really good.”

DP: At this time involved firefighters are witnessing extreme fire behavior, lightning and erratic winds all around them in a surrealistic landscape. Overhead briefings have been brief from the overhead, due to the time crunch to select leaders and implement the Flyway Road burnout plan. At the crew level they have come into the immediate area discussing how to conduct safe operations. Because they are in a safety zone the collective feeling is that “we are safe”. The extreme fire behavior is an awesome sight to the new and old firefighters alike but a constant reminder to old hands that Mother Nature is in control, not them. Now the engines are on the move to the “next” structure with the hand crews on hold, waiting for a strategical plan that can match what they are witnessing. “Chaos” is mentioned frequently and amid this chaos leadership and plans of attack begin to shape up.

2355 - Both engines waiting near the road leading into the second house, are told over the radio to go to the next structure to the south. As they start to back into the second house the engine captain with DIVS’s vehicle is coming back out of the driveway to inform them it is too late. The

engines are told to move up the road again to the Third structure.

Before coming out of this structure the DIVS and the future OSC3 ask the VFD resources already there to disengage. Some vehicles obey the order and leave immediately. The more entrenched volunteer resources refuse to leave, then drag their feet and are finally grabbed by the arms to let them know staying is not an option. They are warned repeatedly that this is now a death trap due to the fire blowout at the first house and an extreme crown fire is already on the way and beginning to heat things up. Finally the resources leave and later are thankful they did.

DP: Many injuries and fatalities result from sticking with (more literally like “sticking to”) initial strategies and tactics which were based on expected fire behavior at the time of the plan. Although the expected fire behavior has been “extremely compromised” there is no corresponding change in the tactics. Clinging to the outdated plans seems necessary to validate the efforts already expended and mentally preferable to pulling out and dealing with doing it all over again up the road. If attachment to the house is like falling asleep then a pull on the arm is a wakeup call. Attachment to objects is a routine daily reality that can prove fatal on the fireline. Recognizing the inherent “stickiness” of mental and physical objects is best done in times of quiet reflection rather than in the heat of the fire. An effort to recognize and understand this effect in your own mind is a prerequisite to having it as a usable skill on the fireline. Just like heavy packsacks, houses can be dropped when your safety and life are at stake.

July 8, 2007

0000 - The future OSC3 is reassigned as OSC3 while at the Second structure. As the DIVS and OSC3 leave the Second house they discuss “we will be lucky if someone isn’t hurt or killed tonight.”

DP: Changing roles, once assigned, may create stress. As you mentally accept a role your mind starts to move in that direction “grasping” and “hanging” on to that role. When the change is made the mind must now disengage from one role and move to adopt the next role. This leads to minor role entanglement because it is harder to disengage from the first role.

The two engines arrive at the Third structure. On the way in, one of the engine captains question if they should be there, but does not voice his concern because it looks more doable as they approach the house. He is the substitute captain. The captain driving DIVS vehicle decides to proceed. At this time there is a small spot fire to the right as they drive towards the house. This spot fire is active and growing in all directions. There is a larger head fire about a quarter of a mile to the north coming their way and another smaller spot fire in the grass and approaching the northeastern edge of the timber stand bordering the house.

0005 - The Engine Captain driving DIVS vehicle is now asked to be the Task Force Leader (TFLD) for both engines. His assistant captain, an engine boss trainee on this assignment, takes charge of their Engine. This role change has further complications.

DP: The two engines have three-person crews. With the loss of the engine captain to be TFLD for the two engines, one engine has fewer actions it can engage in. Appointing a TFLD frees the

DIVS up to focus on the division needs. It is a positive decision but lack of other fire personnel to fill this position leaves the decision with a negative spin. The trainee engine boss is now functioning as the full engine boss, another role change.

The TFLD briefs the crew and discusses the burnout operation around the house. The TFLD directs the crews to initiate the burnout along the road and around the structure while he keeps an eye out for what the fires in the immediate area are doing. The engine captain begins the burnout. Fire is laid first at the more vulnerable north side of the house, starting at the northeast corner of the house. Next fire is laid down at the edge of a mowed area that borders knee high grass. The two-member burnout crew proceeds to run back along the road they came in on until blocked by the expanding spot fire. Their torches kept blowing out due to the wind. The spot fire crosses the road as does the burnout crew. They lay fire on the run, bringing fire back towards the house, around a blue truck near the house then to the back of the house, burning out until they are back to where they started. The first burnout action at the edge of the field to the East allowed this field to begin burning out, expanding their safety zone. Burning out the grass on both sides of the road opened an escape route back out the road they came in on, on the contingency they needed to leave in a hurry. This burnout operation took about 10 minutes.

0016 - At this time the OSC3 and DIVS arrive. Both get out of the vehicle without PPE. Their plan was to do a quick 20 second assessment and make a recommendation then leave. Normally PPE is put on if they decide to stay at the structure any longer. This action of not putting on a fire shelter, gloves, web gear, pack, etc., is based on the time and difficulty of frequently taking PPE on and off.

DP: According to firefighters who were interviewed, not putting on gloves, packs, and a shelter is an accepted behavior when conducting a quick structure assessment. There are harnesses available to mount fire shelters on your chest. These work better for dozer operators and can interfere with steering in other vehicles. While pragmatic, such practices can leave you vulnerable to unexpected changes. There have been ample warnings that this night is different along with gut feelings that it is already too late to save this structure as they pull in. For the first time tonight, all the resources at this house are Forest Service. There is bonding here perhaps masking attachment to this operation more clearly seen at the previous structure when the resources were VFDs. Perhaps not, because there are very few embers falling and the head fire is further away and no crown fire on the way. In addition there may be a false sense of security because they are getting out of the vehicle into an identified Safety Zone.

The engine captain for engine 663 who was the lead burner returned to his engine to roll up hoses which had been pulled out to support the burnout along the road and around the house. Once the Engine Captian has left, his crew member (E663 crew member) asks the TFLD if there is more to burnout and the TFLD tells the E663 crew member to continue to burnout around a nearby RV, but if it gets too hot, to comeback. The mowed grass around the RV wouldn't sustain fire so E663 crew member starts back.

At this time the OSC3 and DIVS motion the E663 crew member to come to their location. The OSC3 asks the E663 crew member to follow the DIVS to do some more burning. The OSC3 has examined the backing fire at the more vulnerable North side of the house. The backing fire here

has burned less than around the rest of the house since it has been backing into the wind. OSC3 feels that laying fire quickly up the hill and back down will increase the survivability of this house. At this time the closest observed fire is in the field about 100 yards away with northwest winds estimated at 5-8 mph.

DP: Neither OSC3 or DIVS contacted the E663 crew member's immediate supervisor nor had the TFLD contacted the E663 crew member's supervisor prior to him burning out around the RV. Since the DIVS had years of experience, the E663 crew member is excited to go as it furthers his OJT. The E663 crew member's desire to continue burning may have distracted him from his obligation to check with his immediate supervisor. The E663 crew member's immediate supervisor, the engine captain, erred in not keeping better track of his crew members. In addition the captain performed a routine task of rolling up the hose, that he could have delegated to the E663 crew member leaving himself free for planning other work. The captain had returned to check upon his other E663 crew member which was a positive. A quick briefing was not given as to how to do the burnout, what the escape route(s) were or what to look out for. The briefing would have had more firefighters involved which may have altered the group knowledge and the later outcome of events. There is time pressure to "do it quick" and knowledge that available burning windows close quickly on this erratic fire. Standard Fire Order number 10 is pertinent at this time.

DP: In a hurry to implement the burnout operation the DIVS forgot he didn't have his gloves or fire shelter. Until he enters the timber he has been making most of his observations while in a Safety Zone. Switching roles from supervising to a role of implementing the decision should have triggered DIVS to get the rest of his PPE. Neither the OSC3 nor the E663 crew member noticed the missing PPE. Attending to the task at hand and the need to do it quickly dominated all three firefighter's attention, interfering with noticing the missing PPE required for the burnout. Whenever notable changes occur we need to alert ourselves that we may need to make corresponding changes to stay safe. At the 2000 International Wildfire Safety Summit this was suggested as a new Standard Fire Order.

The DIVS and the E663 crew member started to light a strip of fire further south and parallel to the house's northern edge. The DIVS led the way and only the E663 crew member had a drip torch igniting as he followed. OSC3 watched them start up the hill, observing that the fire they were lighting was being pulled towards the house as planned. OSC3 then returned to check on the house and talk to the TFLD. The DIVS hurried a short distance ahead to a spot where he could be a lookout and observe the head fire activity to the North. When the DIVS looked back 25 seconds after starting the back burn he observed fire burning below them cutting off their escape route back to where they left the Safety Zone. Not only was the fire just lit by the E663 crew member coming up the hill but a wall of flames had erupted below the entire eastern edge of the timber stand extending a hundred feet wide or more towards the north.

The wind from the Northwest had stopped and the line of fire that had been ignited by the E663 crew member was now fanning out, burning towards the Northwest, uphill towards them as well as pulling back into the fire towards the house. The initial burnout above the house was producing 6-8 foot flames with a hot residual surface fire behind the flames cutting the two off from escaping back to the house. The fire which had erupted along the eastern edge of the timber from an unseen source was the real surprise. The fire to the northwest had moved closer to the

edge of the timber preventing a retreat to the northeast. Unanticipated fire behavior had entrapped them.

DP: Both the OSC3 and DIVS had assessed this burnout operation and felt this tactic was safe, necessary and that they had time to do it. The OSC3 reported that after he left the DIVS and E663 crew member that the wind had stopped as he approached his truck. The wind then gusted and pulled his vehicle door out of his hand as he opened it. He said the gusting wind did not last long and then the normal 5-8 mph wind was back. Neither of the two firefighters in the timber noticed a wind change, only the flare-ups below them when they looked back. However the wind was sufficient in the timber to keep blowing out the drip torch.

If you do not notice a change then there is no warning to change your behavior. Since DIVS is actively trying to access danger yet missing it then how could it have been detected? No one at the house observed how the fire got below them along the eastern edge so we cannot point out a mistake in situational awareness. If OSC3 had stayed to be a lookout below them to guard their escape route back to the safety zone, then maybe a warning to end the operation may have arisen soon enough to avoid the entrapment. The OSC3 could have walked further to the north from the safety zone along the eastern edge of the timber and looked for embers or smoldering areas that could be fanned into flames by a gust of wind. A spot fire had been seen in this area around 2400 by the captain of E663 but no fire was seen by OSC3 and DIVS which may have stopped flaming at the time of their assessment. Double lookouts would be prudent under the extreme conditions and tight time frames. The burnout was to take less than a minute so not much of a time commitment for OSC3.

The DIVS decided that they needed to get out of the timber quickly and that their best chance to escape was to head northwest. As they started their escape, DIVS yelled at the E663 crew member to hurry and the E663 crew member thought he wanted him to keep lighting as they ran. The E663 crew member continued to stop and relight his drip torch. DIVS said he had to grab the E663 crew member to get his attention off of lighting to communicate they were in serious trouble. This is where the E663 crew member thought he had dropped his drip torch. They continued downhill, out of the timber, heading to an area with lesser flames, 2 foot flames to the northeast. As they ran further out into the grass DIVS felt a downdraft and told the E663 crew member to stop. Suddenly the section of grass with two foot flames to the northeast became active producing flames 30 to 50 feet wide, 6 to 8 feet high. The best direction left open was to hook back to the southwest then south towards a wall of 4-6 foot flames backing down a gentle hill. DIVS selected a section of the fire with the lowest flames to run through and led the way.

The DIVS expected the downhill backing fire had a lot of cooler black behind it. After successfully running through these flames the DIVS and the E663 crew member continued southeast looking for a way back to the vehicles. At this time the DIVS noticed in-drafting, followed quickly by a crown fire in the nearby trees to the northwest and west, which began producing extreme radiant heat. The DIVS started to receive burns to his bare hands and face and told the E663 crew member to get to the ground and deploy his shelter. The onset of the extreme heat ended their escape effort necessitating a quick shelter deployment. The DIVS said there was no noticeable delay between a warning pain and his skin burning.

***DP:** The DIVS was using his experience to attend and react to their extreme fire environment. Since the E663 crew member had two years of experience DIVS was watching out for the E663 crew member's safety, possibly to the detriment of his own. In retrospect the in-drafting may have been the warning cue for both to get to the ground and start the deployment. Often a firefighter standing during a deployment results in more severe burns so having the E663 crew member deploy while low to the ground resulted in less severe burns to the E663 crew member but led to a longer deployment time. This shows the necessity to practice deploying while on the ground as recommended in the fire shelter training DVD. The DIVS should have applied the decision he made to the E663 crew member to himself and got down onto the ground. Standing and the longer deployment combined into more severe injuries to DIVS. Concern for other firefighters is a positive action but it should not exclude or lessen concern for one's own safety.*

The E663 crew member began attempting to take his pack off. He unbuckled the chest strap and slipped out of his harness. The pack didn't come off since he had not unfastened his belt buckle. At some point the E663 crew member took his gloves off. The E663 crew member succeeded in getting the waist belt unfastened and the shelter out of the pack's shelter pocket and out of the inner PVC bag by pulling the red loops. He then had trouble shaking it open because he did not pull the right and left handles apart. Seeing his difficulty the DIVS reached in and spread the two handles apart and the wind instantly popped the shelter fully open. The DIVS held on to the back of the shelter as the E663 crew member crawled under first and moved to the front he then asked if he could get under and received the thankful yes. If he had received a no the DIVS had decided to lay down close to the shelter to lessen his radiant exposure. Getting inside the shelter was like closing an open oven door, providing instant relief from the extreme radiant heat.

***DP:** This was a life threatening event under extreme pressure. To the degree you note or focus on the threat itself, it interferes with deploying the shelter. This is a basic principal of mental operations; namely you can only focus on one object at time to the exclusion of all others. This puts a premium on appropriate attention. Practicing shelter deployments with full PPE on helps but you also need to keep tighter mental focus on unbuckling packs and pulling the shelter handles apart and not on what the fire is doing in that same period of time. Earlier E663 crew member thought he dropped the drip torch before going through the wall of fire, yet it was found near the shelter. This shows that he "lost" his drip torch while attending to the entrapment itself. The DIVS does not want to compromise the E663 crew member's safety if there is not room for both under the shelter and has thought of what he needs to do if there isn't room for both of them. In this case DIVS planned to lay on the ground and use the shelter to shield him from the worst heat. Neither is a large person so both are able to get under the shelter. For two larger firefighters this may not have worked. This event was the first time two fire fighters shared a new generation fire shelter.*

In the high radiant heat both fire fighters were burned, the DIVS more so, due to getting under the shelter several seconds later than the E663 crew member. Under the shelter they discussed their injuries and the E663 crew member said his throat is beginning to swell up. With his EMT experience the DIVS interprets this to mean the E663 crew member may have inhaled hot gas and be in potentially critical condition. At the E663 crew member's suggestion both began to pray which had a calming effect.

DP: Several Human Factor issues are involved. If the DIVS had been carrying his shelter, would he have been burned less? The answer is most likely yes. If he had deployed his own shelter quicker than the E663 crew member and gotten under sooner he would have less burn injuries. Gloves certainly would have reduced both hand and face burn injuries either way. But wearing gloves may have just delayed the decision to deploy. If gloves delayed deployment there would have been longer contact times for burns through his clothing to occur. If the Crewmember had been faster getting his pack off and getting the shelter handles pulled apart, and into his shelter, both would have had considerably less severe injuries as every second counts.

Also, if the DIVS has his own shelter and enters it quickly this would leave the E663 crew member alone to figure how to finally get into his own shelter. By helping open the E663 crew member's shelter, the DIVS lessened both their injuries. Finally prayer has a calming affect both because it is a prayer and due to preventing your mind from becoming agitated by focusing on the fire and the overall situation. Awareness and decisions improve after the mind calms down.

Both fire fighters were wearing heavier (non-GSA) Kevlar/Nomex pants which they felt lessened burn injuries. While generally true this is not always the case. Heavier fabrics delay pain onset keeping you in a situation longer. Heavier fabrics store more heat so once fabric conductive burns begin they will last longer once you get out of the heat. They may be preferable to less mobile fire fighters but you pay an added physiological burden wearing them, so not the pant of choice for those digging fireline. If thicker were better, we would have all fire fighters wearing structural turnout coats and pants.

After two minutes under the shelter, the DIVS got out. He said his burns did not worsen, but the E663 crew member staying under the shelter felt it was still too hot to be outside. The DIVS thought that the crewmember's swollen throat meant a quick evacuation was needed to save the E663 crew member's life. Therefore he reasoned it was worth being out in the extra heat to save the E663 crew member's life.

Upon getting out, the DIVS picked up the radio and his fingers stuck to the hot radio. He started shouting MAY DAY many times but others on the radio would not get off. Back at the vehicles the OSC3 and others were attempting contact and also asked others to get off the radio. Once the DIVS first made contact with the OSC3 he first said they were south of the house and then revised it to northwest of the house. The OSC3 then drove through the grass until finding the pair. The TFLD walked to the shelter location arriving moments later to assist loading the two. At this time E663 crew member got out of the shelter.

The DIVS estimated it took up to 15 minutes to get others off the radio though it was likely half that time. Once others got off the radio, DIVS was able to communicate their location and have OSC3 reach their location. Most of this delay was due to non-emergency radio traffic.

DP: Communications were overloaded from the start of this fire. However there is also a reluctance to get off the radio when you hear someone else is in trouble. Almost immediately many firefighters want to get on the radio to ask questions, offer assistance, etc. This need to know is driven by a feeling that since I'm an important enough person to have a radio, I need to say something. In such cases our self concern is outweighing concern for others. Unfortunately,

it took a lot of yelling and screaming on the radio to get firefighters unconnected to this event to get off the radio. Once the radio cleared the rescue process started to work smoothly.

The OSC3, accompanied by the TFLD, drove the two injured fire fighters back to the engine location in the Safety Zone. After dropping off the TFLD, the OSC3 headed for Highway 71 staging area. Collectively, they erred in turning left when the way out was to the right and this delayed getting out to highway 71 by several minutes. Just before reaching Highway 71, the OSC3 called the South Dakota State FMO and ask him to call for an ambulance. At Highway 71 the South Dakota State FMO had an Elk Mountain Engine paramedic with oxygen awaiting their arrival. The two engines, which had made the correct turn, had arrived before OSC3. E663 crew member brought his shelter out with him and gave it to his engine crewmember. With the OSC3 driving the vehicle and the paramedic attending to the two injured fire fighters they drove on to Hot Springs. Due to all the vehicles with flashing red lights they drove past a waiting ambulance. At the outskirts of Hot Springs, they met a police officer who agreed to escort them on to the hospital.

At the hospital, though the DIVS was in worse condition, they first treated the E663 crew member for the more serious gas and smoke inhalation. The E663 CREW MEMBER airways were okay. Due to more limited burn capabilities and Hot Springs, both fire fighters were transported to Rapid City. The E663 crew member had 1st and 2nd degree burns and was released in the morning. The DIVS had more serious and extensive 1st and 2nd degree burns with 3rd degree burns on his right hand and was kept in the hospital two days longer.

Summary

When analyzing accidents, the natural assumption for those of us looking over their shoulders, is that firefighters did what they did knowingly and deliberately. We then focus on what they did “wrong” rather than on what fire fighters, from their perspective, were doing “right.” Looking back we see events unfolded in the observed sequence and error in thinking the events are connected as a causal chain. We miss the multiplicity of choices available at each decision point and focus only on those actually acted upon.

Almost all of our actions have subconscious determinants and so extra effort is needed to bring your own behavior under intentional control. The battle between conscious and unconscious control of behavior is the pivotal effort for increasing awareness and making appropriate decisions and taking appropriate actions. To learn this skill requires becoming more aware under first routine, then with more practice, under extreme conditions. At present this training does not exist anywhere in our fire organization and culture. Becoming more conscious of how our minds work is the **only** way to shift from trying to follow an unending number of rules to principal based actions. Principal based actions can reduce confusion and exert a force that counters latent subconscious actions, that if followed even briefly, shift firefighters into higher risk actions under their present situational pressures.

A Narrative Account and Decision Points were utilized to bring focus to what the involved fire fighters were focused on. The extreme weather and fire behavior are keys to understanding the complexities and time pressures arriving fire fighters were confronted with. Add to the

environmental complexities changing leadership roles and the immediately over crowded tactical radio channels and we complete the physical and mental context for the entrapment that ensued. In this environment, mental functioning automatically degrades. Therefore we cannot expect decisions and actions to reflect full situational awareness, which cannot exist in this environment either. Rather we should expect reduced awareness and decision making and not be surprised when something “goes wrong”. Accidents are “normal” because they reflect the normal way your mind works in such environments. To improve mental functioning on the fireline requires improving your mental skills before you ever go to the fireline.

After the incident, OSC3 and DIVS discussed and pointed out that “we have seen this extreme fire behavior here for five years in a row.” Previously this type of fire behavior was rare. We have begun to “normalize extreme fire behavior” since it is becoming common. Because fire fighters are getting experienced with extreme fire behavior they’re learning new skills, strategies and tactics to keep pace. They do not feel they are intentionally taking higher risks but if you miss a cue or you are a bit slower implementing decisions then consequences “slam you” worse under extreme conditions.

More Wildland Urban Interface training was recommended to recognize trigger points to quickly determine which structures are savable and which are not. Trigger points for these actions reduce the amount of time and thinking to initiate appropriate actions. We need corresponding trigger points for noting when we are being physically or mentally overwhelmed and need to disengage. Were it not for the homes at risk, fire fighters would not have engaged this fire where they were at such a disadvantage.

If we return to the perennial observation that 80 percent of the casual factors are due to human errors and thus mental in origin, then it is reasonable to say training to improve the mind is long overdue. Such training is inherently different from filling the mind with still more information which can lead to overload. Mind or mental improvement enables you to use information, training and experience more efficiently by reducing stress and other distractions. In this entrapment such mental skills would keep you alert to the larger picture and would have warned the involved firefighters that it is time to back off, regroup, wait for daylight and come up with a more comprehensive plan and thus heed their own warnings.

Dr. Ted Putnam
Psychologist