Trail Peak Fire

Firefighter Exhaustion/Electrolyte Imbalance – July 25, 2010

Facilitated Learning Analysis

USDA Forest Service
Dixie National Forest
Pine Valley Ranger District
St. George, Utah

FLA Team Members
Bea Day, Cibola National Forest and Grasslands (Team Leader)
Joe Sean Kennedy, Mendocino National Forest
Todd DeMasters, Boise National Forest
Glen Heaton, Dixie National Forest

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FOREST SERVICE
US
DEPARTMENT OF AGRICULTURE


TRIGGER POINT RIDGE
AIL PEAK FIRE
Left Meadow @ 1130
Medical location
HARMON CREEK TRAIL
Exit Route
Trail Saddle
Oak Grove C
EMS LZ
Resting Point- 2 mile marker
Image USDA Farm Service Agency
© 2010 Google
Image © 2010 DigitalGlobe
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Imagery Date: Jun 23, 2009
37° 18.594' N 113° 27.643' W elev 6859 ft
Eye alt 11793 ft

Executive Summary

The Trail Peak Fire was a lightning caused fire reported on the evening of July 24, 2010 and was contained and controlled at 1803 hours on July 25, 2010.


Slope of Fire Taken by FF#2

On July 25, 2010, at approximately 2015, a Firefighter was incapacitated due to over exertion and an electrolyte imbalance, causing severe cramping of the legs, mild vision and disorientation problems, during initial response of the Trail Peak Fire on the Pine Valley Ranger District of the Dixie National Forest. At approximately 0930 that morning, three firefighters began hiking into the Pine Valley Wilderness area searching for wildfire that had been spotted the previous evening and confirmed the following morning. The first 1.5 miles of their hike was on a rocky overgrown trail with a gain in elevation of approximately 400 feet. At 1130, the crew left the trail trying to gain a visual of the fire. The terrain was very steep, rocky, with mixed conifer and a heavy understory of brush. When the crew reached the ridge at 1330, one firefighter left the others and spent the next 2 ½ hours trying to scout a better vantage point of the fire. The fire was finally located and the crew joined the one firefighter to control it over the next 2 hours.

At approximately 1800, the firefighters began their hike out to the trailhead. Within minutes the firefighter, who did the initial scouting, began to experience minor cramping and exhaustion. At 1913, everyone reached the trail with the firefighter requiring frequent stops along the way down due to extreme fatigue and cramping. The firefighter continued to hike along the trail for another 1 hour and 15 minutes and could then go no further. At that time, the firefighter sat down and began experiencing extreme cramping the full length of both legs, and could not get back up. The firefighter experienced


Picture from Briefing Location 0730 7/25/2010

problems with vision and disorientation and began to deteriorate rapidly, by shaking and showing signs of shock. The crewmembers immediately began to administer aid to the firefighter. The firefighter was still 1.5 miles from where the vehicle was located at the trailhead.

At 2028, one of the crew called dispatch to order a life flight with hoist capability. A Hotshot crew returning from another fire was diverted to help with the rescue if the life flight helicopter could not land on scene. The helispot was deemed unsafe by the pilot and landed at the trailhead to wait for the firefighter to be carried down to the trailhead. The Hotshot crew, which carries a paramedic and several EMT's as crewmembers, reached the firefighter at 2236 and administered a saline IV and oxygen. The firefighter was prepared for transport and started down the trail at 2259. The firefighter reached the life flight helicopter at 0048 and was transported to Dixie Regional Hospital in St. George, Utah. The firefighter was treated for exhaustion and an electrolyte imbalance and released from the hospital on July 26 at 0300 and is currently back to work.


Picture from Air Attack 1130 7/25/2010

Fire Weather – Incident Day

Fire Weather for Zone 439 - sky Weather partly cloudy (35-45% cloud cover). In the valleys…isolated showers and thunderstorms after 1200. In the mountains…widely scattered showers and thunderstorms after 1200.

Max Temperature - near 5000'…94-104

- near 8000'…70-89

Min Humidity - near 5000'…9-19%

- near 8000'…19-27%

Chronology of Events

Time	Event	Decision Process & Risk Management
7/24/2010 2100	Fire was reported to District Duty Officer (DO). DO#2 then notified Engine Module of smoke and approximate location. DO advised the response could be handled in morning and ordered Module to report to Duty Station at 0600 on the 25th.	*DO#2 decided to wait until morning, because engine crew had been on a fire that day. Suppression was not urgent.*
0600	Engine Module reported to duty fully staffed.	
0715	Engine Module (three Personnel) arrived at Leeds Exit on I-15. DO#1 was en route to Duty Station, was in vicinity, and tied in with the Engine Module. The smoke was plotted on map and determined to be in the Pine Valley Wilderness.	*Engine Module decided to stop at the visual point to assess fire situation and ask DO#1's advice on strategy for this.*
0730	DO#1 called the District Ranger (DR) to discuss strategies for suppression response and the decision was made to "Kill It". The DO relayed that to the Incident Commander (IC) who was also the engineer on the Engine. The IC then made the recommendation to get a helicopter to look at it and consider the option of of using a bucket to "Wash it off the Hill." The IC understood DO#1 to say "go and at least take a closer look. I think you might be able to get in there with a bladder bag." DO#1 left and continued with normal duties. FF#1 ate a small snack consisting of rice cakes with cream cheese topping.	*DR knew the fire was an unplanned ignition and knew its approximate location. The DR also knew the fire history of the area and made a decision against using this fire for resource benefits. This was based on time of year with several month of fire season ahead and the location of the fire on the slope.*
0921	The IC with the Engine Crew arrived at Oak Grove Campground & Harmon Creek Trailhead . A size up was then reported to Color Country Interagency Fire Center Dispatch (Dispatch) by	*The decision was made to not bring a chain saw because of the IC's interpretation of the wilderness policy.*

Time	Event	Decision Process & Risk Management
0921 Cont.	the IC. The Engine Crew prepared equipment and started to hike into fire area using the Trail. FF#1 drank a quart of water with electrolyte tablets. IC stated to the crew "you don't need to go all the way into the fire, just get to a vantage point to direct bucket operations."	*Decision was made to not bring in a bladder bag based on the distance of the hike for the weight of bladder bag. The IC directed everyone to take extra water due to the expected difficulty and duration of the day's operation.*
0921-1030	Crew proceeded to hike up the trail into the wilderness area, stopping at a meadow 1.5 miles up from the campground for a rest break.	
1030-1130	The IC then hiked up the trail leaving the engine crew at the meadow to try and find a vantage point to see the fire. The IC returned to the meadow, without seeing the fire, after about 45 minutes. Air Attack (AA) was requested to help the crew navigate into the fire. AA gave FF#1 an updated lat/long. The IC decided to leave the trail at this time to start hiking up a ridge through "steep, rocky terrain, some mixed conifer with thick understory of oak and other brush" to get to a higher vantage point. The IC assigned air attack communications to FF#1.	*IC decided for FF#1 and FF#2 to stay at meadow and rest, while IC scouted for a vantage point.* *IC decided to delegate FF#1 point of contact for aviation communications, in case s/he could not hear AA call while hiking to get a vantage point.*
1130-1327	AA gave assessment to DO#1 that said, "I wouldn't put anyone in there, but the fire has moderate to high potential if it gets out of the rocks." AA took two pictures and emailed them via cell phone to DO#1. DO#1 was not at a computer to receive them.	*AA assessed terrain of fire's location and determined access was too steep to send anyone up there. AA took photos and sent to the DO to relay assessment.*
1130-1327	Engine crew proceeded to hike up the ridge following GPS coordinates. FF#1 noted, "the hike to ridge proved to be very challenging". The firefighter was getting tired and had to stop several times to rest and drank the rest of electrolyte drink.	*AA offered helicopter to help crew navigate into fire by giving a more accurate lat/long.*

Time	Event	Decision Process & Risk Management
Cont.	The crew requested the helicopter to help locate the fire. The helicopter gave FF#1 an updated lat/long and flew over the fire to give a bearing from where FF#1 was at to the fire. The helicopter told the crew, "yes, you can get into the fire."	*From the helicopter's assessment the crew could get into the fire, the crew made the decision to continue.*
1327-1600	Crew reached high vantage point on ridge "Trigger Point Ridge," but crew could not see the fire from that location, even though the GPS was showing that they were only 300' from fire location. Crew reached vantage point on the adjacent ridge and took break. IC and FF#2 remained at Trigger Point Ridge and FF#1 continued on using the GPS to locate the fire. FF#1 "realized hiking conditions were getting significantly worse with large rocks and thick brush." It took FF#1, 45 minutes to move through the brush and boulders to get out of sight of the IC and FF#2. After 2.5 hours, FF#1 noted, "I was becoming exhausted and had difficulty moving and I was stopping often." FF#1 was getting closer to the fire by spotting fallen ash on the ground, and smelling smoke and continued following the smell of smoke and ash fall. FF#1 visually spotted a light smoke column eventually reached the fire. FF#2 and IC hiked over to the fire within 20 -30 minutes. FF#1 was very tired, stayed at bottom of burn, and ate a snack.	*The decision to continue was made, since the GPS indicated only 300' from the fire.* *FF#1 decided the rest of the crew should stay at the ridge, because the crew only had one GPS and it was not efficient to have everyone follow in FF#1 footstep.* *FF#1, even though feeling exhausted, continues due to the indicators of smelling smoke and seeing ash.*
1600- 1800 1600- 1800 Cont.	FF#1 assigned FF#2 to work on helicopter bucket operations as the IC went to the top of the fire. FF#1 remained at the bottom of fire and constructed a small amount of hand line. FF#1 noted, "I was very tired, but was in a good presence of mind for decision making." IC performed hand line construction at top of fire and updated Dispatch on control and	

Time	Event	Decision Process & Risk Management
	containment of incident. FF#1 showed FF#2 the GPS track and it showed how zigzagged was the path taken while scouting the fire. Evidently the accuracy of a GPS at that location, for that time of day was only within 300'.. IC released helicopter and FF#1 ate a rice cake, cream cheese and drank water.	
1800-1915	Crew determined the easiest route to hike out was to proceed straight down hill to a saddle where the trail was. Two compass bearings were taken, and the crew proceeded down the hill. During the hike out, FF#1 noted that s/he had to scout a route around a small ledge. FF#1 was "crashing through the brush and steep terrain." FF#1 needed to stop several times on the way down towards the trail and stated, "I was surprised how fast I was becoming exhausted." The IC reached the Harmon Creek Trail @ 1915 and took a rest break while waiting for FF#1 and FF#2 to catch up. FF#1 made it to the trail and stated to the crew, "I am extremely exhausted." It took a few minutes to determine whether they were actually on the trail due to overgrowth in the vegetation. FF#1 used a GPS to verify location of trail. They then proceed towards the trailhead. IC was leading the way followed by FF#1, and FF#2 in the rear. FF#1 had to use a tool as a walking stick, and stopped several times in exhaustion. FF#1 told the crew to "proceed ahead and s/he would catch up."	*FF#2 made the decision to follow FF#1 down the hill because FF#1 was showing signs of fatigue.*
1915 – 2020	Crew stopped at the 2-mile marker on the trail for a quick break. Then they continued down the trail for ¼ mile, then FF#1 told IC and FF#2 to "continue ahead without me, and I will meet up with you at the meadow." When FF#1 arrived at the meadow, (five minutes behind IC and FF#2), and, "I plopped down with my legs out stretched,	*FF#1 thought the meadow was closer than in reality and did not want to show weakness in front of the crew. That is why FF#1 told the crew to go ahead.*

Time	Event	Decision Process & Risk Management
	propped up against my pack." FF#1 told his/her friends, "I hate to tell you this, but I don't think I'm going to make it to the trailhead."	*FF#2 had concerns about leaving FF#1, but respected FF#1 enough to not question his/her judgment.*
2020 – 2035	IC contacted DO#1 to inform that they may have to spend the night. FF#1 sipped on some water and then asked the other two for help getting up to continue the hike. At that time, both legs started to cramp causing severe pain. FF#1 sat back down, started shivering, and stated verbally, in an uncharacteristic manor "I'm @$*#^!." The IC, an expired first responder, saw FF#1's condition begin to deteriorate rapidly, took the radial (wrist) pulse, and got a "thready" reading. IC also noticed that FF#1 was showing signs of discoloration in and around the eyes. The crew took FF#1 boots off to take a pedal (foot) pulse and could not get a reading. FF#1 stated that he had I've lost feeling my right foot." And, "I'm sinking! I'm exhausted!" The IC was fairly certain that FF#1 was going into shock The IC made another call to the DO#1 to inform of FF#1 condition and get advice. DO#1 instructed IC to contact CCIFCD to order medivac with hoist. DO#1 was getting ready to respond to the incident from home. ***During this time, FF#1 said, "the IC and FF#2 gave me profound encouragement, displayed excellent cohesion, and helped stabilize me. FF#2 called my spouse and sister for me and asked if I wanted to pray together"***	*IC assessed the condition of FF#1 and decided that the firefighter could not make in back to the trailhead and may have to spend the night.*
2020 – 2035 Cont.	Once the IC hung up with DO#1, IC tried to radio Dispatch to order a medivac, with a hoist, but had no success with hitting the closest repeater. Then the IC tried to call Dispatch via cell phone, and was unable to get a signal. The IC then tried again to hit the repeater and was again	*IC knew that immediate action was needed to get assistance to FF#1 as quickly as possible. IC called DO#1 because of their trust and confidence in each other. DO#1to get the best help in the shortest amount of time.*

Time	Event	Decision Process & Risk Management
	unsuccessful. IC then moved across the meadow to an opening in the brush and was able to hit the repeater, but the message was scratchy and unreadable. At the same time, FF#2 got cell coverage and called Dispatch to relay the message to Dispatcher#1, who was new to the Dispatch Center, that said, "Heat exhaustion, order ambulance and Mountain rescue." Dispatcher#1 called over the two other dispatchers (Dispatcher#2 and #3), who were on duty and more experienced to handle the incident Radio communication was very intermittent to the point that dispatch had to play back the transmission several times to understand what was said. Dispatch's interpretation of the situation was dire, firefighter was down, and that they (the firefighters) were on the Harmon Creek Trail. Dispatcher#3 then called the IC's personal cell phone to figure out who was injured, From that conversation, it was determined who was injured, and that there was a need for a medivac helicopter. A medivac helicopter was then ordered by Dispatcher#2 via Washington County Dispatch by landline. DO#1 contacted another DO (DO#2) to take fire management duties over for the district. DO#2, asked DO#1 if help was needed on the incident, DO#1 said yes and to respond to OGCG with Gatorade. DO#1 contacted a third DO to take over duties.	*The IC tried all methods of communication to contact CCIFCD to get EMS ordered.* *Dispatcher#1 notified the other two dispatchers that there was a serious incident and a firefighter needed assistance.* *Dispatcher#3 knew the IC and called on a personal cell phone to get clarifying information.* *Dispatcher#3 used radio play back to decipher radio transmissions to clarify messages conveyed.* *Due to the direction of the antenna on the repeater, all resources (field and dispatch), relied on multiple forms of communications, i.e. cell phones and radio to communicate.* *Dispatcher #2 considered calling back the local helicopter, but by the time the helicopter was able to fly, it would be up against "pumpkin time" (30 minutes after sunset). The decision was made to call Washington County to order medivac.* *Thought process for transfer of DO duties was to ensure coverage for additional incidents.*
2040	FF#1 going into shock. IC and FF#2 built a warming fire and wrapped FF#1 in a space blanket.	*FF#2 suggested they build a warming fire to keep FF#1 warm.*

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2044	Volunteer Fire Department (VFD) en route to the campground. Two paramedics from St George were also en route. After starting to warm up from the fire, FF#1 stated that the fire had a calming effect and increased well-being. The firefighter's state of mind started to become clearer, and the firefighter began to realize all of the actions the IC and FF#2 were doing to help. With all the communications the firefighter sensed their anxiety and wanted to reassure them, so they joked a little with each other.	
Unknown	IC called via cell phone to Dispatch to notify them that "100' of line with a hoist will clear the area."	
2047	Dispatch called Washington County 911 to relay "100' of line with a hoist will clear the area."	*Medivac with hoist was never ordered from Washington County.*
2055	DO#1 and DO#2 en route to campground. The local Hotshot crew was ordered, and diverted to incident, since they were en route back to quarters from another fire.	
Unknown	Anonymous, restricted call to IC's cell phone asking, "Do you really need the helicopter? Can't you get the firefighter down to the trailhead?" IC was uncertain who was calling and frustrated at the questions being asking. Told the caller, "who the "blank" are you" and hung up.	

Time	Event	Decision Process & Risk Management
2104	Medivac flight advised they are en route and 50 minutes out.	
2123-7	VFD and DO#1 on scene at campground. VFD assumes IC and relays to Washington County.	
2141	Medivac helicopter in area and in communication with IC at meadow via radio.	
2141 – 2157	Helicopter made an attempt to land and due to the rotor wash, the warming fire embers were blowing onto FF#1. IC told the helicopter to pull out. The helicopter came in for the second try and declined to land because the approach was too steep. The helicopter landed at the campground.	*IC was not going to move FF#1 until the helicopter confirms the viability of the helispot, so the IC asked the pilot to fly over at a higher elevation to assess.*
2152	DO#2 arrived on scene and receives order from DO#1 to grab stokes and proceed up the trail to FF#1. A paramedic offered to go with DO#2 and replies, "I have the Hotshots coming shortly and they have a paramedic with them, but if you want to come I'm leaving now." The Paramedics declined.	*DO#1 assessed the need to get the stokes up the hill ASAP.* .
	FF#2 en route back down trail to help direct DO#2 to the meadow and flagged the route.	*IC told FF#2 to assist DO#2 find the trail.*
2207	Hotshots on scene. Briefing from DO#1 to Superintendent; light gear, yellows, and hard hats only. Shortly thereafter DO#1 & Superintendent proceed up the trail to the meadow.	*DO#1 wanted the hotshots to quickly get to the meadow and advised to go light on gear to expedite trip up and back.*

Time	Event	Decision Process & Risk Management
2221	VFD released themselves.	*Once the VFD confirmed they were not needed they returned to station.*
2236	Hotshots on scene at meadow. Their paramedic and EMTs began to administer O_2 and I.V. to FF#1.	.
2259	FF#1 loaded onto stokes basket and ready for transport. Fire shelters and other items were used to keep patient warm and comfortable during transport.	*DO#1 said to use everything they had available including fire shelters to make FF#1 as secure and comfortable as possible during transport.*
7/26/2010 0048	FF#1 at medivac helicopter and loaded for transport.	
0103 - 0300	FF#1 at Hospital DO#1 & DO#2 arrive at Hospital Patient assessed by doctor and diagnosed to have an imbalance of electrolytes and physical exhaustion, and released.	

Lessons Learned & Shared by the FLA Participants

- **IHC**
  - "We hired this hotshot specifically, because s/he was a Paramedic." We do not pay our employees to go to Emergency Medical Service (EMS) training initially, but if they come to us with the training we will help them keep their qualifications. There is no Medical Direction to our qualified EMS personnel, but they have the training and expertise. We are going to use those folks.
  - The "Communication was freakish" (outstanding) between the crewmembers during transport of FF#1 in the stokes on the trail. The crew had trained on SOP for medical emergency, but hadn't practiced on moving a patient in a stokes before. All of the pieces fell into place, and everyone fell into step.
- **Following up with Washington County EMS & Finding out Aircraft Capabilities - Dispatch**
  - Should have called back Washington County Dispatch to check on status of medivac. No direct communication between Dispatch and medivac ship, and Dispatch was unaware of where medivac was coming out of. Dispatch was also unaware of what kind of capabilities a medivac ship had concerning hoist and night vision. Dispatch had assumed the medivac was coming with a hoist, but Washington County did not place an order for that capability.
  - Locations of medivac ships are unclear. Dispatchers had the understanding that there was a medivac ship stationed in St. George when there was not.
  - Organize dispatching workload, so dispatcher has only one focus during an incident. (Incident within an Incident)
  - *"This happens so infrequently I can't remember the last time a medical like this has happened"*
  - *"If it happened 40 minutes earlier it would have been a no brainer."* (Local helicopter would have still been on duty and would have been dispatched to incident).
  - Communications on Toquerville Repeater were intermittent at best. Playback had to be used throughout the incident to hear what was said.
  - Medivac helicopter capabilities' – DO& Dispatch need to know their capabilities within their local area.
- **Radio Repeater Functionality - All**
  - If equipment is not working like it should, make sure to follow through and get it fixed.
- **Ask More Questions in developing plan – IC, FF#1, FF#2**
  - Ensure that all concerns are addressed while developing the tactical plan.
  - Ensure commitments are made up and down the organization that fosters a culture where all opinions (GS-3 to 13) are valued and accepted.
- **Communicate with others Agencies – DO#1**
  - Develop a cooperative atmosphere between fire departments that adjoin the district boundary.
- **Take Charge of the Situation – DO#1**
  - "I never officially transitioned between the DO#1and IC, but I took command at the campground."

  - Need to communicate with local agencies to better coordinate operations.
  - *"You are dealing with Volunteers and unsure of their capabilities and limitations."*
  - *"I trust only people I know and types of resources I am familiar with"*
- **Micro-manage – IC, FF#1, FF#2**
  - Not trusting decision making of the IC's by the DO's within Color Country Interagency Fire Management Area.
  - A perceived lack of trust from the engine module in getting the job done.
  - Unknown Phone call made to IC during Incident by "Unknown Caller" asking if a helicopter was really needed and why couldn't FF#1 walk down trail.
  - "Everyone's voice should be important (seasonal) without fear of repercussion"
- **Follow the Gut Feeling - IC**
  - It's not as easy on a mundane fire due to compliancy
  - One of the Common Denominators on Fire Tragedies
  - *"The Risk Management Process Broke Down"*
  - *"A person needs to know their trigger point"*
  - *"Know limits and respect it"*
  - "Don't Let Guard Down"
  - "Don't let Rank sway your decision". (If you are an IC and your boss is under your command, remember you are in command of all resources. If you want advice ask for it, but remain in command at all times).
- **Hike together Stick Together – IC, FF#1, FF#2**
  - Don't walk ahead of anyone that is struggling just because they say to do so. "Buddy system"
- **Preplan – VFD**
  - "Could of played better together" coordinating efforts at Campground, and communications by getting on the right group in the radio sooner.
  - "Reach out for more information" Who was responding, what is available, did not know the IHC was responding.
  - VFD feels that they are not trusted.
- **Dig Deeper – DR**
  - Ask more questions on the "how" (strategies and tactics) and not just the end state.
- **Tactics – DO#1**
  - *"If there was a fire to rappel, this was it"*
- **Management Came Together - All**
  - Management worked well together during and after the incident within an incident. Primarily during the transport of FF#1 down the trail in the stokes basket.
  - Remained Calm during incident to get FF#1 off the mountain.
- **Knowing the Capabilities of your resources - All**
  - Know the strengths and weaknesses of the team.
  - "Team is only as strong as your weakest link"

FLA Team Members Observations*: Changing Hindsight to Foresight in Risk Management*

This incident was not a fireline accident. This is an example of what can happen to anyone in the Agency who goes out into the field.

1. The participants believe that the risk management process broke down in several instances; the largest being the re-evaluating was not completed. Employees, and leaders alike need to have a constant vigilance in the risk management process, and it needs to become a part of the everyday thought process. Leaders also need to verbalize their use of the Risk Management Process to all so that next generation will know how to utilize the risk management process, verses just being able to memorize it.

   The participants realized that communication broke down throughout many levels on this event. They also realized that there have been underlying communication issues existing within the fire organization for quite some time. This prevented open and honest communications throughout this incident. A commitment was made by all parties to work on improving lines of communications for future operations.

2. The participants truly believe that the medical treatment given by the paramedic on the IHC was a critical turning point in the condition of the firefighter and could have been the difference between life and death. Even though the IC's First Responder certification had expired, the IC knew well the signs that FF#1 was going into shock and began treatment to prevent further decline of his/her condition. The IC also realized the urgent need to order a medivac.

   There are no Agency standards for Medical Direction as required for EMT's and Paramedics to be able to use their skills. This is a National issue on sponsorship that requires a paramedic to have a Medical Director to work underneath (endorsed). The Agency's stance on the medical policy is very unclear when it comes to how we treat our own employees as well as pay for trainings for those who have the certification.

3. Participants identified the need for everyone to develop and understand the standard operating guidelines for the district and dispatch center. Leadership needs to ensure that plans are developed and in place to handle these types of emergencies, so they can be able to just pull it off the shelf and implement. The next step is to test these plans with simulations to find their holes and weaknesses.

4. Medical emergencies are high risk/low frequency events that happen throughout our organization that we rarely drill for, or have simulation exercises. In contrast, fire shelter deployments are the same high risk/low frequency events, but are trained for much more frequently. Medical emergencies need to be trained for in the same way, so that everyone can become more familiar with the SOG's to ensure the best care and response for the injured employee within the Golden Hour.