LESSONS LEARNED

Northern Region Aviation Safety

South Meadow Creek Simulation

South Meadow Creek Simulation Lessons Learned Report

Purpose

The purpose of this Lessons Learned Review is to assess the aviation aspects of the South Meadow Exercise, which was conducted to test EMS coordination and readiness. The Lessons Learned Review is not an effort to find fault, but is instead intended to identify opportunities to improve the performance and safety of all involved. The LLR will be conducted in a non-blaming, non-punitive manner that will stress organizational learning.

Executive Summary

On May 22, 2014 the Madison Ranger District of the Beaverhead-Deerlodge National Forest conducted a full scale, real time emergency response simulation exercise known as the South Meadow Creek Simulation. The purpose of the exercise was to simulate a wildland fire burn over scenario with injuries and evaluate the effectiveness of the response. As the planning unfolded for the event, many of the local cooperators and stakeholders became involved in the scenario. As these new participants were included, it was decided to run the simulation through the full duration of a real life event. This included on-scene patient triage, activation of wildland and local 911 dispatch systems, patient transport, local hospital mass casualty plans, notification processes and overall emergency services cooperation. A plan was developed with clearly stated objectives and a degree of secrecy was involved to keep the scenario as close to a real life situation as possible.

As the scenario progressed, two unplanned aviation incidents occurred. The first helicopter's patient transport (Helicopter #1) departure was normal, without complications. During the second patient

transport via air ambulance, the helicopter (Helicopter #2) required more power to exit the landing zone than anticipated. Helicopter #1 had returned and was getting ready to depart with patient load number three, and experienced ground resonance; an aerodynamic phenomenon that required a quick reduction of power and rapid shutdown of the engine and rotor blade system. The decision to stop the simulation at that point was made by the simulation coordinator. After questions regarding the helicopter events were discussed, forest leadership and regional office fire and aviation management decided to look at the incident from a learning perspective. A Lessons Learned team was given a delegation to examine the aviation aspects of the simulation. Emphasis items included gaps in policy regarding risk management and approvals for exercises and possible "best practices" for training simulation procedures.

Planning

The South Meadow Creek simulation had been in the planning stages for months and on April 24, 2014 the Forest Service and participating cooperators had the opportunity to come together for a South Meadow Creek Simulation planning meeting. Meeting attendees included representatives from:

- Madison County Sheriff's Office
- Madison Valley Rural Fire Department
- Ennis Volunteer Ambulance Service
- Department of Emergency Services County Coordinator
- Madison Valley Medical Center
- Two Local helicopter air ambulance services

"Train like we fight, fight like we train" - Sim Coordinator

The idea behind the simulation was to enact a real life scenario to evaluate response times and evacuation plans in place within the Beaverhead-Deerlodge Fire Crew personnel, testing their understanding of Dutch Creek Protocols (NWCG, 2010). Cooperators wanted to test their own processes and systems as well, so the simulation was designed to go through the duration of a real life event. The simulation was only scripted up to the point at which the responding team established an Incident within an Incident and an Incident Command Post. The simulation coordinator would be one of three monitors in orange vests whose responsibility it was to control the scenario; if at any point the accident scene or scenario became unsafe the monitors would step in and take control.

The objectives for the scenario were as follows:

- Test Air to Ground Radio Communication between Agency Personnel and both helicopter air ambulance services.
- Test GPS Coordinates/Datum's with helicopter air ambulance service and Local Dispatch Centers.
- Familiarize Beaverhead-Deerlodge Fire Crew Personnel on helicopter air ambulance service capabilities and restrictions.

- Evaluate effectiveness of Agency Medical Emergency Evacuation Plan (MEEP).
- Test Dillon Interagency Dispatch Center and 911 Dispatch Medical Emergency MCI Check List as well as efficiencies between communication channels.
- Evaluate interagency cooperation between Madison County and the Forest Service
- Evaluate Madison Valley Medical Center's MCI Capabilities

In order to meet the goals and objectives of all participants, it was determined that simulated patients needed to be flown in the two air ambulances. There was some confusion about whether or not Forest Service personnel could be transported on helicopters for the simulation. The Forest Aviation Officer (FAO) was approached early in the planning process for direction. After consulting the Regional Aviation Safety manager, the FAO advised against flying any Forest Service employee passengers.

Two weeks before the simulation, the simulation coordinator attended a Regional Helicopter Manager Workshop and had the opportunity to discuss the simulation possibilities with some of the Regional Aviation Staff. The simulation coordinator learned there was a process that could be used to allow FS personnel to be flown during simulations; that process included completing a Project Aviation Safety Plan (PASP). After bringing this information back to the Forest Aviation Officer, the decision remained unchanged due to time constraints and FS personnel were not to be flown in the simulation. With the support of the District FMO and Line Officer, a choice was made to allow non-FS cooperator volunteers to fly as patients. SOPs for both life flight helicopters required all role players to fill out a release form in order to be flown on the air ambulance. Because FS personnel were not going to fill that role, a PASP was not completed.

The Simulation

Press Release - "Ennis, Mont., May 22, 2014 – The Beaverhead-Deer lodge NF and Madison County will be conducting a simulation on Thursday, May 22. The simulation will test Wildland firefighters and local area emergency personnel on their knowledge, skills, and abilities regarding response to a mock fire and burn over injuries.

The firefighters and emergency personnel involved in this simulation will not be aware that this is a test and should believe the events that unfold during the day are real.

The fire portion of the simulation will begin at 11 a.m. and escalate throughout the day. The injuries (burn over) will occur around 1 p.m. Life Flight is participating and plans on being on scene around 2 p.m." (BDNF, 2014).

The scenario was a Type 3 Wildland Fire Incident. Before the simulation began, a 20 person crew of firefighters had hiked in and lit piles up on the ridge, creating lots of smoke on the lee side. The crew members were moulaged up for trauma simulation with bruises, burns, blisters, simulated bone, latex wounds, and thick blood. Some had chicken noodle soup to throw up. Their helmets and saws were melted, nomex and shelters burnt. It would appear that half the people made it into shelters, and half did not.

> *"You don't get this experience from a powerpoint"—Sim participant*

The simulation began at the scheduled time and all cooperators participated who were at the April 24 planning meeting, except the Madison County Sherriff's Office. The simulation had inputs throughout the scenario which escalated the incident to a point in which the 20 person crew and the Incident Commander got burnt over. At that point the remaining two crews were forced to establish a command structure, activate ALS, triage patients, arrange transport, and deal with the ongoing fire incident.

Simulation Outcomes

The simulation was a huge success, and all predetermined objectives were met. During the scenario there were two unplanned aviation related incidents, which caused some concern. The first occurred as Helicopter #2 was exiting the landing zone with the patient on board (second patient load for the simulation); the helicopter appeared underpowered and the pilot had to reposition within the LZ before exiting. The second event occurred when Helicopter # 1 attempted to leave the LZ (third patient load for the simulation); and experienced ground resonance, an aerodynamic phenomenon. As a result, the pilot executed a reduction of power and rapid shutdown of the engine and rotor blade system. At this point the simulation coordinator chose to end the simulation.

Two After Action Reviews (AARs) were held, one immediately at the conclusion of the simulation and a second more formal AAR on May 30, 2014. Representatives from all the responding agencies attended. Both aviation events were discussed in depth. The air ambulance service (Helicopter #2) that experienced the underpowered issue has decided that they will use a helicopter with better capabilities due to their experience. The other event had been described as a possible "ground resonance" incident. It was concluded the pilot's response was appropriate. The conclusion of the AAR deemed the simulation as very successful and met all of the objectives. All of the agencies agreed about the value of simulation based training and committed to participating in the future.

Lessons Learned

The following is a short list of several of the views expressed by those involved as to what they believe the organization should learn from the experience.

· Cooperation and coordination is critical to the success of exercise objectives.

· There is greater value in "playing out" a simulation all the way through, allowing events to unfold as they would in real life.

· More risk can be acceptable if there is more value added, provided it is discussed and agreed upon with appropriate staff members.

· Discussion and education between the various agencies regarding who has responsibility and operational control of the various responding resources is needed.

· Designated simulation monitors/safety officers visible and known by all were important to the safe implementation of the exercise.

Summary

Our training culture has evolved over the years and we now include many different mediums to educate new and seasoned wildland firefighters. We use a mixture of traditional classroom courses, "sand table" exercises, staff rides and simulations to learn from. As we are tasked to continually seek safer and more efficient ways of doing business with our partners, simulations will play a larger role in this cooperation. A "whole community" collaborative based approach like the South Meadow Creek simulation is aligned with current Forest Service direction and the Federal Emergency Management Agencies' (FEMA) disaster management planning recommendations.

Full scale simulations involving cooperators operating under their own policies and SOP's can lead to situations involving greater risk. Accepting greater risk however, can increase the value of lessons learned from this type of training. How can we identify gaps in our preparedness without testing the entire process?

As with any project, consideration for risk management must be included. Evaluating the hazards associated with exercises of this size should be part of the planning process. The scale and scope of the exercise should determine the level and format of hazard mitigation. Many tools currently exist to accomplish this task including Job Hazard Analysis (JHAs), Project Aviation Safety Plans (PASPs) and the ICS Form 215A Incident Action Plan Safety Analysis. Subject matter experts could also be involved in this process including forest and regional level safety managers, aviation managers and qualified incident safety officers. The risks should be identified, discussed by all involved, and ultimately approved by those who have the responsibility and authority to accept it. Also, sharing this methodology with our partners may provide greater insight to their understanding of our own policies as well as provide opportunities to see other risk management processes.

The South Meadow Creek Simulation provided an opportunity for local stakeholders to come together,

learn from one another and evaluate the effectiveness of the response. A relatively new helicopter air ambulance service experienced performance issues in a controlled simulation and thereby identified a need to subsequently increase their capabilities. This is a desired outcome, and one that may have prevented an aviation accident in the future.

The lessons learned team had the initial expectations of looking at a minor aviation incident. We left with a greater appreciation for simulation based training and an understanding the need for and providing a few "best practices" to guide future similar exercises.

Parting thought….

From the Chief's Letter of Intent and 2014 Wildland Fire Risk Management Protocols… "Engage key stakeholders and partner agencies in tabletop exercises or other venues to ensure alignment."

Bibliography

BDNF. (2014). Media Advisory. Ennis: USFS.

NWCG. (2010). NWCG#025-2010. Boise: NWCG.