Session No. 705

Hitting the Ground Running: The EH&S Officer's Role in Emergency Work

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Introduction

Today, we will review approximately 50 years of "hitting the ground running" in emergencies involving private and public sector operations, and local, state and federal government jobs and challenges as far ranging as ski patrolling to the Olympics.

In order to circumvent legal and confidentiality issues, this paper, for the most part, will avoid referring to specific organizations and personnel. Some EH&S officers lead lives that are very predictable, on schedule, and well within their area of expertise.

A typical day would involve working on short- and long-range plans, generating vacation schedules and personnel evaluations; attending numerous less-than-exciting meetings and maybe working on budget issues. Also there might be some report writing required, an accident or incident to investigate, a certain amount of process inspection "walk the works," and the likelihood of fitting in some training activities. Surely there is plenty of bona fide work but nothing that tends to push your blood pressure off the charts. However, when confronted with emergencies/disasters, the challenges for EH&S personnel can escalate exponentially. All of a sudden you've got a train wreck.

TYPICAL EHS DAY

- Planning
- Personnel activities
- Meetings
- Budget review
- Reports
- Accident investigation
- Process inspection
- Training

Figure 1. Typical EHS Officer's Day

Hopefully you and your team have prepared for the various contingencies well in advance of their happening. Goetsch¹ has a good chapter dealing with the planning aspect for emergencies.

The Superfund Amendments and Reauthorization Act of 1986 (SARA), under Title III, sets forth the Emergency Planning and Community Right-To-Know Act (EPCRA). EPCRA requires that State Emergency Response Commissions (SERCs) and Local Emergency Planning Committees (LEPCs) be

formed. Local companies' emergency plans are to be incorporated into the LEPCs master plan. So, if your emergency involves hazardous chemicals, this is a good place to start.

I live in Bellingham, WA, which is in Whatcom County, the main border entry to Vancouver, B.C. Several years ago, our LEPC which I served on for a decade was expanded in scope to provide additional coverage with the increased volume of traffic and potential problems anticipated for the Vancouver 2010 Winter Olympics. Bringing in the State Patrol, Border Patrol, the Whatcom County Sheriff, the Bellingham Fire Department, and LEPC personnel together in one command center greatly enhanced their ability to deal with emergency issues.



Figure 2. LEPC Manager (Doug Dahl) in the new unified command center

Tank Fire in Carribean

Let's begin the review of disasters by looking at three shots of a tank farm fire in the Caribbean. In the first shot, you'll note 2 remote monitors putting water on the fire . The scope of the blaze is extensive, and as it continues into the night the safety issues are numerous.



Figure 3: Three photos of a tank farm fire in the Caribbean

Citgo Coker Blaze in Cheyenne

This incident in Cheyenne below in Figure 4 is smaller in scope but surely challenging. This Citgo Coker blaze started in one unit (second short) but rapidly spread (third photo); it is important to not the buckling steel.



Figure 4. Citgo Coker blaze in Cheyenne.

Oil Refinery Fire in India

Moving on, we witness here an oil refinery in India (see Figure 5). A massive amount of BTUs were involved and the scope was major.



Figure 5. Oil Refinery Blaze in India

Mumbai High Platform Incident

Going offshore, we encounter the Mumbai High Platform incident (see Figure 6). The platform was rammed by the MSV vessel, which triggered the fire.



Figure 6: Mumbai High Platform Incident

As can be seen in Figure 7, the fire destroyed the platform and spread to an adjacent facility, Back on land again we visit Tank 373 (second photo) where the fire crew is setting up. When all was said and done the containment held, and only one tank was involved.



Figure 7. Photos of Mumbai High Platform Incident

Gas Pipeline Fire in VIrginia

The aerial shots in Figure 8depicts a gas pipeline in Virginia. Two roads were blitzed in this incident, which would adversely impact area traffic.





Incident Command System and the Role of the Safety Officer

These are examples of big incidents and big problems. Some type of management system is necessary. This is where the Incident Command System (ICS) comes into play (see Figure 9). In the ICS structure, one designated official is in charge of the entire operation, His His/her direct subordinates must be small in number (5-7) so as not to become overwhelming.





Figure 9. Incident Command System (ICS) Structure

The safety officer is a member of the Command Staff (see Figure 10) and is "seated at the table."



Figure 10.Command Staff Flowchart

The role of the Safety Officer (see Figure 11) involves assuring the safety of all involved persons and includes "red tag" authorization to shut a job down. That being said, the Safety Officer should always strive to promptly find a satisfactory answer to safety/health issues and keep the disaster operation moving ahead

Role of the Safety Officer

 Develop and recommend measures for assuring personal safety and health
Assess and/or anticipate hazardous and unsafe situations
Assigned to Command Staff
"Red Tag" Authorization

Figure 11. Role of the Safety Officer

Cascade Mountain Ski Rescue

Moving to another type of emergency, we leave the oil refineries and tank farms for high in the Cascade Mountains, land of the steep and deep (see Figure 12). There we find skiing and snowboarding operations. Emergencies for Ski Patrollers hit hard and fast. You'll need your caches well stocked and ready to go. The gear needs frequent inspection



Figure 12. Cascade Mountain Rescue Operations

In Figure 13 (photo 1), the Patrol arrives at the scene of a cliff rescue with a vertical drop of 180 feet. It's a nasty day in the mountains but you can't circumvent or shortcut safety (see Figure 13, photo 2).



Figure 15. Rescue Operations in the Cascade Mountains

The mainline and belay must support both a rescuer and patient (see Figure 15, photo 1). It's cold, tough work with no margin for error.



Figure 15. Cascade Mountain Rescue

Now the rescuer is positioned to drop in with the main tensioned and the slack to be taken out of the belay line (Figure 15, photo 2). The descent is progressing (Figure 15, photo 3), and line handlers are closely working the show. Edge protection is critical to prevent cutting either the line on ice or rocks (Figure 15, photo 4).

EH&S Issues in Emergency and Disaster Rescues

In recent years, the U.S. has been pounded by hurricanes. Ike was no exception and here we see it center punching Galveston (see Figure 16).



Figure 16. Radar Image of Galveston Hurricane



Figure 17. Rescue Team in Action in Hurricane Disaster

In Figure 17 (photo 1), we see a rescue team moving into action. What safety issues do you detect and what is your corrective action? The devastation was massive, and in Figure 17 (photo 2), debris has been pushed out of one lane to enable traffic to again move.

Would you envision a house fire in a flood? Well, the photos in Figure 18 show such a disaster, and with the strength of the wind, it can easily spread. Think of the challenge for fire fighters and the possible safety issues. The flood waters are rising, and evacuating a frightened 1000-pound horse will pose an interesting challenge to your crew.



Figure 18. Fire in Flood

This is not Haiti or Chile; it's Texas (Figure 19, photo 1), and rescue of personnel or retrieval of belonging in such a structure pose a number of serious exposures. Even the fish don't do well in floods (see photo 2).



Figure 19. House Collapse in Fire/Flood in Texas

Major property damage occurred on land and sea and in this case, large pleasure boats were swept onto a roadway (Figure 20, photo 1). Local and freeway traffic ground to a halt. This driver of this 18-wheeler probably has a dismal report for his dispatcher (photo 2).



Figure 20. Damage from Texas fire/flood to pleasure boats and 18-wheeler

Health issues arising from contaminated flood waters are a concern for victims such as the gentleman in Figure 21, as well as for rescuers. What provisions does the EH & S officer have in place for decontamination and proper inoculations?



Figure 21. Man trapped in car in Texas fire/flood

In Figure 22 we have another fire in a flood, and the wind has spread it to adjacent structures.



Figure 22. Fire in Flood spreading to adjacent structures

Community plans must emergency plans must include evacuation routes. The convoy in Figure 243is leaving the danger zone. Note that one vehicle has extra water and stove fuel on board.



Figure 23. Convoy leaving fire/flood zone

As an EH&S officer, you'll have sensitive and emotional issues as in this cemetery (see Figure 24, photo 1) confronting you. In Figure 24 (photo 2), only one house is left standing. Be prepared with stress councilors and other resources to deal with distraught citizens.



Figure 24. Sensitive and emotional issues Safety Officers must deal with

Hazards are numerous as both rescuers and property owners work in areas with damage and debris (see Figure 25, photo 1). Make certain that all personnel working on and over the water always wear life jackets (photo 2). Miles of roads were impacted such as this stretch of Interstate #45 (photo 3). Note the force of the storm on the Jersey barrier.



Figure 25. Damage and debris hazards of fire/floods

These workers were removing broken glass several stories up in a major high rise building (see Figure 26). Some personal protective equipment (PPR) is evident, but what about fall protection?



Figure 26. Workers removing broken glass in high-rise building

Safe and proper evacuation of livestock can put some excitement into the EH&S officer's day (see Figure 27). Are you prepared?



Figure 27. Removing livestock during a flood

Not only are floods wet but note the velocity of the water in this residential area (see Figure 28).



Figure 28. Velocity of flood water in residential area

Let's leave the Gulf Coast and their challenges and visit a ski area in the Pacific Northwest. Chairlifts are used to transport skiers and snowboarders high into the Cascade Mountains. A chairlift is a mechanical device. In spite of the best maintenance, they can, or on rare occasion, cease to function since they operate in an extremely harsh winter environment. If a lift cannot be promptly restarted, then the Ski Patrol swings into action with a chair evacuation. This can entail working a chair over a mile of rugged mountain terrain and lowering several hundred people in some cases over 100 feet to the ground.

How about that for some interesting safety and health issues for both the Patrollers and the customers? Note in Figure 29, the rescue "T" seat has been positioned below the skier and the rescue rope is in place over the chair lift cable. Here a skier is being lowered to the ground, As the skier nears the ground, patrollers stand by, ready to stabilize the individual when contact is made with the snow.



Figure 29. Ski Patrol Rescue from Chair Lift

Moving back to the Gulf Coast, we can review how reception centers, command outposts and emergency shelters are brought on line. This particular facility was activated after Hurricane Katrina (Figure 30, photo 1). Through the joint efforts of local, state, and federal units, the abandoned and vacant 200,000 square foot supermarket was ready to go for emergency use in six days (Figure 30, photo 2). It entailed mega jobs for the safety officer and here the fire hydrants are being flow tested (Figure 30, photo 3). Moving inside, the entire sprinkler system was inspected and repaired.



Figure 30. Setting up emergency centers



Figure 31. Setting up emergency centers

Going topside, the HVAC units were checked and serviced (Figure 31, photo 1). Based on heat index and occupancy projections, an additional 40-ton chiller was brought in. This necessitated a rubber-tired crane to hoist the chiller and components to the roof (Figure 32, photos 1 and 2). Talk about flexibility



Figure 32. Rubber-tired cranes lifting chiller and components to the roof

We have to break away temporarily from this site and go inspect a marshalling yard, where incoming gensets were beings serviced. (Figure 33, photo 1). Next stop was the inspection of one of the units installed at a command post (Figure 33, photo 2).



Figure 33. Marshalling yard and inspection of units installed at command post

Now back at the supermarket we had up to 23 scissors lifts in operation, replacing lighting and electrical components .It is important that these electricians be trained to properly operate the lifts (Figure 34, photo 1). Out in back, there is a sanitation and safety problem with a flooded and filthy loading dock (Figure 34, photo 2). A broken dock leveler required welding and cutting. A fan was used to keep fumes away from adjacent workers (Figure 34, photo 3).



Figure 34. Operations needed at the supermarket

Housing and Recreation for Work Crews and Victims

Another aspect of long-term disasters is housing for work crews and victims. Here we have a mobile home marshalling yard (Figure 35, photo 1). Consider security, lighting, walking, and driving surfaces, sanitation and recreation. There are plenty of considerations for EH & S personnel. Some aspects of the job may seem mundane. However, in Figure 35 (photo 2), we have a sidewalk slab that was "floated" by the flood. Safety worked with this office manager to mitigate the problem until repairs could be made. In spite of the best plans and execution, illnesses and injuries can occur. In this case, a field medic station was well-equipped and staffed and strategically located (Figure 35, photo 3).



Figure 35. Housing and recreation for work crews and victims

2010 Winter Olympics in Vancouver, B.C.

The 2010 Winter Olympics @ Whistler, B.C., were literally fun and games for thousands. However, many hundreds of workers and emergency personnel were busy behind the scenes around the clock. Here is a chow hall/rest area at the Alpine Event area (Figure 36, photo 1). EH&S involvement is critical from conception and planning all the way to close-out at completion of the games (Figure 36, photo 2). Rescue crews must be properly billeted and positioned. This ambulance group has their housing and vehicles at the same location. Here is the author's team at the 6,000 ft level near the Men's Downhill Course ready for action (Figure 36, photo 3).



Figure 26. EHS at the 2010 Winter Olympics in Vancouver

Here is a winch cat grooming a steep slope (Figure 27, photo 1). A broken cable could cut an unsuspecting person in half. Safety must secure such areas. Downhill racers exceed speeds of 85 mph (Figure 27, photo 2). Our Canadian partners had excellent EH & S coverage for the Olympics. The competitors were world class (Figure 27, photo 3).



Figure 27. EHS on the ski slopes at 2010 Vancouver Olympics

Figure 28 (photo 1) is the author's staging on the men's downhill with the ladies' downhill in the background. The competitors are pushing the limits right to the ragged edge over a 3-kilometer extremely fast and icy surface (Figure 28, photo 2).



Figure 28. EHS on men's and ladies' downhill skiing at the 2010 Vancouver Olympics

This racer crashed and is being airlifted out via helicopter long-line technique (Figure 29, photo 1). The paramedic and injured racer are then transported to a medical facility (Figure 29, photo 2).



Figure 29. EHS rescue of skier at 2010 Vancouver Olympics.

To cap off our deliberations, a disaster-oriented EH &S officer needs a multifaceted set of skills— the more the better See Figure 30). Such EHS person must be people-oriented and have the ability to thrive in a chaotic environment. He /she must exhibit dynamic leadership, be decisive and goal-oriented: "Get the job done!" Positive effective communication skills are a must and by all means be FLEXIBLE.

Disaster Oriented EH&S Officer Multi-Faceted Skills People Oriented Thrives in Chaos Exhibits Leadership Decisive Goal Oriented Positive Communicator Flexible

Figure 30. Qualities for Disaster-Oriented EH&S Officer

Endnotes

¹ David Goetsch, Occupational Safety & Health for Technologists, Engineers, & Managers, 3rd Edition.

Chapter 17, Prentice Hall.