Safety Management Today

Emergency Response

What's Inside

In The News

Terminal's lack of preparedness nearly ends in explosion and fire

Employees at a Bridgeport, CT freight shipping terminal faced dangerous chemical, fire, and explosion hazards as they tried to contain a highly flammable and explosive chemical spill without proper training and personal protective equipment, U.S. Department of Labor Occupational Safety and Health Administration investigators have determined.

"These workers were essentially defenseless. They did not know how to evaluate the hazards involved, what personal protective equipment to use, and what steps to follow to contain the spill safely. Worse, no one present at the terminal did," said Robert Kowalski, OSHA's area director in Bridgeport. "These deficiencies in emergency response by [the company] put its employees at risk of death or serious injury."

The investigation determined a forklift was being used to move a pallet of tetrahydrofuran from one truck to another when a 55-gallon drum containing the liquid was punctured accidentally. Tetrahydrofuran is a highly flammable liquid with a flash point of 1.4 degrees Fahrenheit. The chemical began leaking through the truck bed to the ground. The company employees attempted to contain the spill with sorbent material beneath the truck and by cordoning off the area. OSHA investigators found that the terminal's management lacked an emergency response plan and had not trained employees as first responders.

Management also did not evaluate the hazards associated with tetrahydrofuran, failed to provide the responding employees with appropriate respiratory protection and personal protective equipment, and did not have a qualified person on-site to oversee the response. The terminal's emergency action plan also did not include procedures for timely reporting of emergency events. It was also noted that employees had not been briefed on updates to the plan.

As a result of these conditions, OSHA found two repeated and four serious violations of workplace safety standards. The company faces $86,900 in proposed fines. The repeated violations stem from similar hazards cited by OSHA during a 2011 inspection of the company's terminal in Chicago. ■

Rely on yourself *first* for emergency response

We've heard it before: All incidents are local. In an emergency — whether it's a chemical spill at your facility or a regional weather-related disaster — the first, most immediate response will come from your facility and your employees. Are you comfortable that all will go as well as it could?

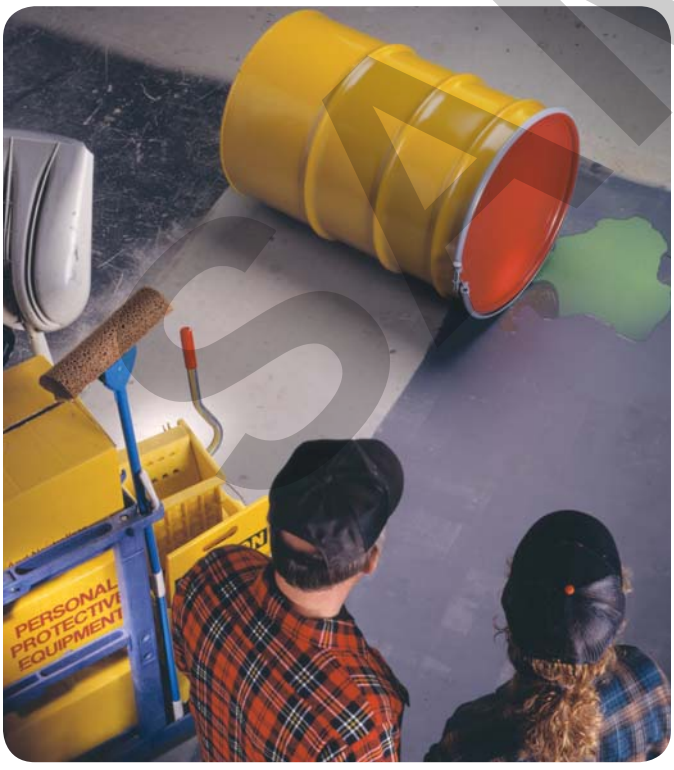
The front line

Guidance materials for public health officials and emergency responders talk about "initiating the public health response during the first 24 hours (i.e., the acute phase) of an emergency or disaster." Twenty-four hours is a long time to wait when lives are on the line. What will you do until help arrives?

Assessing, developing, and planning is all well and good, but when *something happens* it's time for action, not words.

Examine facility-level response

Let's take a look a hazardous material spill at your facility as an example. Obviously, a spill of this nature can threaten life, health, and property. It could result in the evacuation of a few people, a section of your facility, or an entire neighborhood. How will your employees handle such an event?



Can everyone who works in your facility identify containers that hold hazardous materials? Are those containers properly labeled?

Emergency planning rules require that you have Safety data sheets (SDSs) for all hazardous materials at your location. If a hazardous material spills, how long will it take someone to find the SDS and decide what to do? Would you feel safer if employees knew what to do without having to look it up?

Can your employees recognize hazardous material spills and releases? Do they know how and when to notify management and emergency response organizations of an incident?

How would you warn employees throughout the facility of the incident? If you'll use a PA system, what would happen if the power is out? How would you notify residents in nearby neighborhoods if *they* need to evacuate?

The more you can do for yourself, the better off you'll be. Response from outside takes time.

Based on your operations, should you have an emergency response team to control hazardous material spills? Can you afford to wait for an outside response? Could lives and money be saved by being able to respond internally?

Do internal responders have the type and amount of supplies they need to handle an incident? Do they know where those supplies are and how to use them? Are the materials expired or out-of date?

You are likely already aware of hazardous materials used in your facility processes. Do you know what hazardous materials were used in the construction of the physical plant? Could those become a factor in an incident?

Analyze the wider impact

The incident above relies on the assumption that your facility is the only one having a problem, and outside emergency response organizations are available to come to your aid. What would happen if the entire region was impacted by an incident?

In an area-wide incident, like an earthquake or tornado, your employees may need to rely on themselves for some time before outside responders can assist. In a case like this, it is even more important to be able to rely on internal response, since outside responders may be unable to get to your facility, or may be tied up with numerous other calls.

Think about the facilities affected by hurricanes in recent years. How would your facility cope if an outside response was delayed by days, or even weeks?

Do your employees know what to do if the facility is isolated by a weather or terrorism event? Do they have the necessary supplies to survive until help arrives? What if your area power supplier is out of commission? What if you can't get fuel for your generators?

What is the chain of command? What if key people are injured in the incident? How will you communicate, with others inside your facility *and* with outside agencies? How will you and your employees communicate *with your families*?

Ask tough questions

Check your emergency plans and ask tough questions for every aspect of it. Are the procedures practical? Would they get done what needed doing in an actual emergency? What if your primary methods are unavailable (because of utility interruptions, for example) or impossible to implement (because of collapsed buildings)?

Make it simple for yourself – list what needs to be done in any incident (get people out, shut down the operation, etc.) and then make sure your plans and training will achieve those results. Consider every potential disaster – an internal incident, an incident that affects your entire community, and even an area- or state-wide disaster.

Don't be afraid to ask yourself the tough questions about the status of your emergency response plan. It will help you identify areas that can be improved and may save lives and dollars after an incident occurs. ■

Workplace emergencies: Be prepared by having a plan

Emergencies happen quickly, unexpectedly, and require immediate response. An emergency may be as limited as a worker feeling heat stress, or it may be as vast as an explosion that spreads toxic fumes throughout a community. And, any hazard on site can precipitate an emergency.

In order to effectively handle any emergency, proper planning is essential to being prepared.

Prepare

The single most important step in preparing for an emergency is to have a well–thought–out emergency response plan in place, and the best time to plan is before an emergency occurs. If not, it can lead to a disorganized evacuation or response, resulting in confusion, injury, and property damage. Therefore, you first need to evaluate your operations to:

- Identify critical products, services, and operations;
- List potential emergencies;
- Assess the impact; and
- Evaluate internal and external resources.

Identify critical products, service, and operations

By identifying the critical products, services, and operations of your company, you will be able to better assess the impact of emergencies and the need for potential backup systems.

See **Workplace emergencies**, continued on pg. 4

Workplace emergencies, continued from pg. 3

Areas to review include:

- Company products and services that are produced and the facilities and equipment used to produce them;
- Products and services that are provided by suppliers, especially sole–source vendors;
- Lifeline services, such as electrical power, water, sewer, gas, telecommunications, and transportation; and
- Operations, equipment, and personnel that are vital to the functioning of the company.

List potential emergencies

Listing the types of emergencies that could affect your company will help you to focus on creating a comprehensive method for planning, organizing, and implementing an emergency response system.

To minimize injuries, illnesses, claims, and costs that are the result of an emergency, there are several steps you can take:

1. Develop a list of possible emergency situations that could affect your facility,
2. Determine the most likely causes of each situation,
3. Consider your resources and options for handling each emergency situation, and
4. Commit to a strategic plan of crisis and recovery management.

Once you have a general consensus on what can go wrong, create some detailed scenarios for each potential disaster. After the disaster strikes, what problems will need to be solved? You may be faced with injuries and fatalities, damaged property, toxic spills, or power outages. How will each of these situations be addressed?

When developing your list of potential emergency scenarios, consider gathering historical data, geographical data, and information about human error. Then, evaluate the role that these elements can play in an emergency situation.

Assess the impact

Analyze the potential human impact of each emergency — the possibility of death or injury. Consider potential property losses, including the costs to replace or repair the damaged property. Consider the potential loss of market share.

Assess the impact of:

- Business interruption,
- Employees unable to report to work,
- Customers unable to reach the facility,
- Interruption of critical supplies, and
- Interruption of product distribution.

You may wish to rate the severity of the human, property, and business impacts (i.e., catastrophic (4), critical (3), moderate (2), and minor (1)). The human impact includes safety, health, and psychological impacts on people at, near, or responding to the emergency. The property impact includes property, technology, infrastructure, and environmental damage. The business impact includes financial, compliance, contractual, operational, image, and other impacts.

While knowing the severity of each impact will help you prepare for an emergency, knowing the probability of an emergency is just as important in determining which emergencies have the highest risk. Rank the human, property, and business impacts by likelihood (i.e., expected (5), likely (4), moderate (3), unlikely (2), or rare (1)).

The risk of an emergency is equal to the severity plus the probability of an emergency. In other words, risk equals severity plus probability. You'll want to calculate this rating for each impact category — human, property, and business.

Totaling the risk scores for the human, property, and business impacts, you can generate a list of the emergencies with the highest, probable total impacts. Once you have this list, you can look for ways to eliminate or reduce these emergencies, their severities, their probabilities, and their impacts. You might alter or slow the emergency to a point with less risk. You might locate core business processes

or mission-critical systems where they will not be affected. You might also implement an alarm system and training program to eliminate or reduce the human impacts of these emergencies.

Evaluate internal and external resources

Many external resources could be needed in an emergency. In some cases, formal agreements may help define your relationship with the fire department, hospitals, police, or other organizations. Resources and capabilities that could be needed in an emergency include:

- **Personnel** — Fire brigade, hazmat response team, emergency medical services, security, evacuation team, and public information officer.
- **Equipment** — Fire protection and suppression equipment, communications equipment, first aid supplies, warning systems, emergency power equipment, and decontamination equipment.
- **Facilities** — Emergency operating center, media briefing area, shelter areas, first-aid stations, and sanitation facilities.
- **Organizational capabilities** — Training, evacuation plan, and employee support system.
- **Backup systems** — Arrangements with other facilities to provide for: payroll, communications, production, customer services, shipping and receiving, emergency power, and/or recovery support.

Assess your resources and ability to respond. Identify employee skills (such as medical, engineering, communications, and foreign language skills) that might be needed in an emergency. Consider each potential emergency and each resource needed to respond. For each emergency, ask yourself:

- Do we have the needed resources and capabilities to respond?
- Will external resources be able to respond as quickly as we need them, or will they have other priority areas to serve?

When assessing resources, remember that community emergency workers — police, paramedics, and firefighters — will focus their response where the need is greatest. If they are focused elsewhere, response to your facility may be delayed. Steps to correct deficiencies might include:

- Developing additional emergency procedures,
- Conducting additional training,
- Acquiring additional equipment,
- Establishing mutual aid agreements, and/or
- Establishing agreements with specialized contractors.

Plan

Once your analysis is complete, address the findings through a written emergency action plan (EAP). An EAP describes procedures to ensure employee safety if a fire or other emergency occurs. At minimum, it should identify who to contact for plan information, describe the alarm system to alert workers, and include procedures for:

- Reporting fires and other emergencies;
- Emergency evacuation, including exit route assignments;
- Employees who stay behind to continue or shut down critical plant operations;
- Accounting for all employees after evacuation; and
- Employees who perform rescue or medical duties.

A simple plan will suffice in most small settings with no hazardous materials or processes, where employees evacuate when notified. More complex plans are required where employees work with hazardous materials, fight fires, perform rescue and medical tasks, or delay evacuation to shut down critical equipment.

In addition, designate and train employees to assist the evacuation of other employees, especially those with disabilities. Review the EAP with each covered employee when the plan is developed or an employee is assigned initially to a job, when an employee's responsibilities change, or when the plan is changed.

Remember, a well-developed plan and proper training will result in fewer and less severe injuries, as well as reduced structural damage during emergencies. ■

Do your employees understand their emergency response role?

Every employee needs to understand the evacuation plan, alarm systems, reporting procedures, and types of potential emergencies.

Employees should know the following, at a minimum:

- At least two exits from every room/area;
- The sound/signaling method of the evacuation or other alarms;
- Who to contact in an emergency;
- How to escape in the dark if necessary;
- Where the fire/evacuation alarms are located and how to use them; and
- How to report damaged or malfunction safety systems and back-up systems.

Training should address the following:

- Individual roles and responsibilities;
- Threats, hazards, and protective actions;
- Notification, warning, and communication procedures;
- Emergency response procedures;
- Evacuation, shelter, and accountability procedures;

- Location and use of common emergency equipment; and
- Emergency shutdown procedures.

You may need to provide additional training (e.g., first aid procedures or fire extinguisher use) depending on the responsibilities for designated employees.

Conduct training at least annually and when employees are hired or when their jobs or the emergency action plan changes. Provide additional training when new equipment, materials or processes are introduced, when the layout or design of the facility changes, when procedures have been updated or revised, or when exercises show that employee performance is inadequate. Conduct drills at random intervals, and include outside police and fire authorities.

Employee responsibility

During an emergency, employees need to follow simply instructions as follows:

- Evacuate (or proceed to a shelter location) quickly in an orderly manner.
- Listen for instructions over the building's public address system.
- Report to the designated meeting place.
- Don't re-enter the building until directed.

However, there are times when evacuation does not go as planned. If employees become trapped, teach them to:

- Stay calm and take steps to protect themselves.
- Go to a room with an outside window and telephone for help, if possible.
- Stay where rescuers can see you and wave a light-colored cloth to attract attention.
- Open windows if possible, but be ready to shut them if smoke rushes in.
- Stuff clothing, towels, or newspapers around the cracks in doors to prevent smoke from entering the room.

Practice the plan

Drills and exercises will help you prepare. Frequently practice what you intend to do during an emergency as follows:

- If you rent, lease, or share office space, coordinate and practice evacuation and other emergency plans with other businesses in your building.
- Hold education and training seminars to provide information, identify needs, and develop preparedness skills.
- Perform tabletop exercises with the emergency management team. Discuss responsibilities and how each individual would react to emergency scenarios.
- Schedule walk-through drills where teams actually perform their designated functions. This generally involves more people and is more thorough than a tabletop exercise.
- Practice evacuating and sheltering. Have all personnel walk the evacuation route to a designated area and test procedures for accounting for all personnel.

Also, keep training records, and evaluate and revise procedures based on lessons learned. Involve both personnel and community responders in the evaluation process. ■

Rescue your emergency action plan with an audit

Once you've developed an EAP, review the following questions to evaluate the plan. Checkmark the items for which you can answer yes.

	Does the plan consider all potential emergencies that could disrupt your workplace?	Common emergencies include fires, explosions, floods, hurricanes, tornadoes, toxic material releases, radiological and biological accidents, civil disturbances, and workplace violence.
	Does the plan consider all potential internal emergencies that could disrupt your workplace?	Conduct a hazard assessment to identify any physical or chemical hazards that could cause an emergency.
	Does the plan consider the impact of these emergencies on operations, and is the response tailored to the workplace?	Brainstorm worst-case scenarios, consider what you would do as well as the likely impact on your operation, and develop appropriate responses.
	Does the plan contain a list of key personnel with contact information, including local emergency responders, agencies, and contractors?	Keep your contact list current and provide for emergency communications so that contact with local agencies can be swift even if telephones are not working.
	Does the plan address how rescue operations will be performed?	You may choose to rely on public resources to conduct rescues. Make sure any external agency you identify is prepared to respond as outlined in your plan. Untrained individuals may endanger themselves and those they are trying to rescue.
	Does the plan address how medical assistance will be provided?	Treatment of a serious injury should begin within minutes of an accident. Establish a relationship with a local ambulance service so transportation is readily available.
	Does the plan identify how to access personal information on employees?	Include employees' home telephone numbers, the names and numbers of their next of kin, and medical information.
	Does the plan identify the conditions under which an evacuation would be necessary?	Identify situations that require evacuation. The extent of evacuation may differ for various hazards.
	Does the plan identify a chain of command and designate a person authorized to order an evacuation or shutdown?	Select a responsible individual to lead and coordinate your emergency response and evacuation. The coordinator should be responsible for assessing the situation, overseeing emergency procedures, notifying and coordinating with outside services, and directing shutdown of utilities or plant operations if necessary.

See **Rescue**, continued on pg. 8

Rescue, continued from pg. 7

	Does the plan address the actions expected of employees for the various types of emergencies?	The plan may specify different actions depending on the emergency. Employees might assemble in one area if threatened by a tornado, but evacuate during a fire.
	Does the plan designate who, if anyone, will stay to shut down critical operations during an evacuation?	Identify locations where utilities (such as electrical and gas) can be shut down for all or part of your facility. Individuals who remain behind must be able to recognize when to abandon the operation or task and evacuate.
	Does the plan identify evacuation routes, and are these posted where employees can see them?	Exit routes should be clearly marked and well lit, wide enough to accommodate the evacuating personnel, unobstructed at all times, and unlikely to expose personnel to additional hazards.
	Does the plan address procedures for assisting people during evacuations, particularly those with disabilities or who do not speak English?	If needed, designate evacuation wardens to help move employees from danger, and ensure that enough wardens are available at all times during working hours.
	Does the plan identify one or more assembly areas (as necessary for different emergencies) and a method of accounting for all employees?	Confusion in the assembly areas can cause delays in rescue, or result in unnecessary search-and-rescue operations. Take a head count after evacuation, identify anyone not accounted for, and pass along their names and last known locations to the person in charge.
	Does the plan address how visitors will be assisted in evacuation and accounted for?	Consider having all visitors and contractors sign in when entering the workplace. Area wardens, if established, can assist these individuals to evacuate safely.
	Does the plan identify a preferred method for reporting fires and other emergencies?	Dialing 911 is common, though internal numbers may be used. In some cases, employees may activate alarm systems.
	Does the plan describe the method to alert employees, including disabled workers, to evacuate or take other action?	Make sure alarms are distinctive and recognized by all employees. Consider an emergency communication system, such as a public address system, for broadcasting information. Alarms should be heard, seen, or otherwise perceived by everyone in the workplace. Otherwise, wardens must ensure that all employees are notified. Consider an auxiliary power supply for alarms in case of electrical failure.
	Does the plan identify how and when employees will be trained so they understand the types of emergencies that may occur, as well as their responsibilities?	Offer training when you develop your plan and when new employees are hired. Retrain employees when your plan changes, when new equipment or processes are introduced, when new types of hazards require special actions, or when employee responsibilities or designated actions under the plan change.
	Does the plan address if and how often drills will be conducted?	Hold practice drills as often as necessary. Include outside resources such as fire and police departments when possible. After each drill, evaluate the effectiveness to identify the strengths and weaknesses, then work to improve the plan.

DIRECTOR OF EDITORIAL RESOURCES: Paul V. Arnold

EDITOR: Jennifer Stroschein

CONTRIBUTING EDITORS: Robert Ernst, Michael Henckel, Peter McLaughlin, Travis Rhoden, Judie Smithers, Mark Stromme

ISSN 1090-3445 GST R123-317687 (41050)

J. J. Keller & Associates, Inc.®
Since 1953

Printed on Recycled Paper (30% Post Consumer)

PRINTED WITH SOY INK