Chapter 8: Emergency Response

Site management must provide a detailed SOP for emergencies, including fire, explosion, spills, or other situations that cannot be handled by workers on site. The site safety and health plan is required by 29CFR1926.65 and includes a section on Emergency Response. Knowing what to do during an emergency and practicing it beforehand helps workers protect their safety and health.

Chapter Objectives:

After completing this module, you will be able to:

1. Explain OSHA's requirements for a written, site-specific emergency response plan
2. Identify the important parts of an emergency response plan
3. Explain the need for the Incident Command System (ICS)
Case Study

Workers were cleaning out an old factory in Brooklyn that used potassium cyanide and many different acids. During cleanup two leaking drums were put next to each other by accident. The chemicals combined to form hydrogen cyanide, a highly toxic gas. Workers struggled to see the exits due to the gas in the air and left the building slowly. Once they got outside there were not enough showers to hose the chemicals off everyone quickly. Finally, the first worker who finished decon called the fire department. **Why did this happen?**

No one thought ahead about what kinds of emergencies could happen on this job. They did not plan ahead with exit signs, a sufficient number of showers, and SOPs for notifying the fire department. In this chapter, you will learn about planning for emergency response to prevent these kinds of problems.
What is an Emergency Response?

According to OSHA, emergency response is an effort by employees, or by other designated responders (i.e., mutual-aid groups, local fire departments, etc.), from outside the immediate release area to an occurrence that results in an uncontrolled release of a hazardous substance. OSHA defines “outside help” as anyone other than employees working in the immediate area or maintenance personnel. Notify your supervisor whenever you detect a spill or release. The supervisor will decide whether outside help is required. Responses are not considered emergency responses when employees in the immediate area can control the hazardous substance at the time of the release. Controlled means the substance has been absorbed or neutralized, or that the safety and health hazards have been eliminated by other means. For example, a spill of 100 milliliters (3 ounces) of acetone can be cleaned up by workers in the area and is unlikely to result in safety or health hazards. Responses to releases with no potential safety or health hazard are not considered to be emergency responses. The most common emergencies at waste sites are spills, fires, and explosions.
Site characterization & analysis includes knowing the status and capabilities of emergency response teams that would provide assistance to hazardous waste clean-up site employees at the time of an emergency. A hazardous materials (HAZMAT) response team is:

- An organized group of employees and may include a team that is established by fire departments, local, regional or state governments.
- Designated by the employer
- Expected to perform work to stabilize and control leaks or spills of hazardous substances
- Required to approach to the hazardous substance in some situations
- Not the same as a fire brigade

A HAZMAT team responds to potential releases of hazardous substances to control or stabilize the incident. A HAZMAT team may be a separate component of a fire brigade or fire department.
Emergency Response Plan (ERP)

In accordance with 1926.65(q)(1), **employers must develop and implement an emergency response plan (ERP) as part of the site-specific safety and health program.** The ERP must be designed to handle anticipated emergencies and be put in place prior to the start of emergency response operations. The plan shall be in writing and available for inspection and copying by workers, their representatives, and OSHA personnel.

The emergency response plan must be consistent with the disaster, fire, and/or other emergency response plans of local, state, and federal agencies and address:

- Evacuation routes and procedures, including safe distances and places of refuge
- Pre-emergency coordination with outside parties
- Emergency recognition and prevention
- Lines of authority, training, and communication
- Site security and control
- Rescue, medical treatment, and first aid
- Decontamination, PPE and emergency equipment
- Procedures for reporting emergencies to responders and governmental agencies
- Post emergency review and follow-up

**Employers who evacuate their workers from the danger area and prohibit them from assisting in an emergency are not required to have an ERP. Instead, these employers must provide an emergency action plan that meets the requirements of 1926.35 or 1910.38**

**The ERP must be reviewed periodically.** If site conditions have changed or new information is available concerning hazards, the employer must update the ERP.
The emergency response plan must be rehearsed regularly as a part of the overall training for site operations. Make sure you know where to go and what to do before an emergency occurs. When it happens, it is too late to read the plan!

Workers shall not be permitted to participate in or supervise field activities until they have been trained to a level required by job function and responsibility. Employees who may be exposed to hazardous substances while responding at hazardous waste sites must be trained to respond to expected emergencies.

First aid training is not typically included in the basic 40-hour Site Worker mandated by 1926.65. However, first aid considerations and emergency medical treatment are required components of the site safety and health plan. Personnel designated to provide first aid require advanced training and are necessary for emergency response.
In a medical emergency, get the victim out of the hot zone, decon as completely as you can, wipe off and remove PPE, and tell medical personnel what has happened.

**An employee alarm system shall be installed to:**

- Notify employees of an emergency situation;
- Stop work activities if necessary;
- Lower background noise in order to speed communication; and
- Begin emergency procedures

The alarm system must produce a signal (noise, light, etc.) that can be perceived by all affected workers. All alarms must be distinct and recognized as signaling a specific action. The employer shall ensure that all components of the alarm system are approved for the work site and operating properly.

**The alarm system must be tested at least every two months.** The system must be operational at all times and during repairs or maintenance a back-up system must be operational. Maintenance work must be done by trained personnel only.

**During site-specific training,** the employer must explain the alarm system and how to report an emergency. Emergency telephone numbers must be posted near the telephone or in obvious locations.

If you observe a life-threatening situation, it is your responsibility to:

1. Activate the alarm system;
2. Notify the supervisor or emergency coordinator; and
3. Carry out your designated activities.

**Post emergency response is the portion of a response performed after the immediate threats have been stabilized or eliminated and clean-up has begun.** If these activities are performed by the workers who were a part of the initial emergency response then they are not considered post emergency response.
Incident Command System (ICS)

The Incident Command System (ICS) is the chain-of-command system used in emergency and disaster response plans. The number of people involved and the roles of each person depend on the types of emergencies that could occur at a site. Planning, training, and practice are required to make sure that each team member knows his or her role. Site-specific training is required for effective response to an emergency situation.

Incident Command System (ICS) is used to manage emergency situations (like chemical releases) by providing:

- Unity of command (one person in charge)
- Span of control to manage personnel (3 - 7 people under one supervisor)
- Life safety code (priorities of protection are life, environment, then property)
- A modular system to manage resources (a system that can expand and contract with the emergency event)
- Common terms to promote seamless communication.

An ICS separates emergency response personnel into five groups or sections: Command, Operations, Planning, Logistics, and Finance and Administration.

The Command Staff is responsible for health and safety, communicating with the public, and coordinating with other agencies and groups. The Incident Commander/Unified Commander remains responsible for these activities or may assign individuals to carry out these responsibilities and report directly to the IC/UC.

Although a single Incident Commander normally handles the command function, an ICS organization may be expanded into a Unified Command (UC). The UC is a structure that brings together the “Incident Commanders” of all major organizations involved in the incident in order to coordinate an effective response while at the same time carrying out their own jurisdictional responsibilities. The UC links the organizations responding to the incident and provides a forum for these entities to make consensus decisions. Under the UC, the various jurisdictions and/or agencies responders may blend together throughout the operation to create an integrated response team.
The Operations Staff is responsible for all operations directly applicable to the primary mission of the response.

The Planning Staff is responsible for collecting, evaluating, and disseminating the tactical information related to the incident, and for preparing and documenting Incident Action Plans (IAP’s). An IAP is prepared at a decided upon frequency (1, 2, 4 times per days) to set response priorities and objectives and to allocate resources to meet those objectives.

The Logistics Staff is responsible for providing facilities, services, and materials for the incident response.

The Finance and Administrative Staff is responsible for all financial, administrative, and cost analysis aspects of the response.

The ICS structure is fixed but the size and specifics can be adjusted for the incident. ICS is a standardized on-scene incident management concept designed specifically to allow responders to adopt an integrated organizational structure without being hindered by jurisdictional boundaries. Many smaller incident responses will not require Planning, Logistics, or Finance sections while larger responses will require many people in each of the five sections.

Anyone involved in emergency response would benefit from a better understanding of the ICS. Addition information and training is available from:

- FEMA - [http://www.training.fema.gov/is/nims.aspx](http://www.training.fema.gov/is/nims.aspx)
Summary: Emergency Response

An emergency is any sudden or unexpected event requiring outside help. Emergency response workers need sufficient training before they may respond to an emergency incident. **This course does not qualify you as an emergency response worker.**

The emergency response plan is a written plan that is put into action before cleanup work begins. The plan must be site specific and it must be available for workers to copy or read.

You will be able to clean up small spills on site without outside help. For large spills or medical emergencies, you will need to get out and call for trained help. In a medical emergency, get the victim out of the hot zone, decon as completely as you can, wipe off and remove PPE, and tell medical personnel what has happened.

**Work sites must be properly equipped to respond to emergencies.** Telephones, horns, fire extinguishers, spill control equipment, and other equipment are needed when responding to incidents and alerting employees.

Part of planning for emergencies is deciding who is in charge. **The Incident Command System (ICS) is a pre-planned chain of command that specifies lines of authority, communication, and responsibilities.**
Background Reading Material: Emergency Response

OSHA Incident Command System (ICS) eTool

Hazardous Waste Operations and Emergency Response
(29CFR1926.65) (I) Emergency Response

Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities
October 1985. (NIOSH #85-115)

Part 9  Site Safety Plan, p.2-3, 7-8
Annex 7  Emergency Operations Color Codes

NIOSH Pocket Guide to Chemical Hazards.
Activity 10: Wireless Information System for Emergency Response (WISER) Leaking Barrels in a Warehouse

Adapted from WISER’s Warehouse training scenario http://wiser.nlm.nih.gov/training.html

If you have not already done so, search for and download the WISER application on your smartphone or tablet. Alternatively, this exercise may be completed on a personal computer with internet access by visiting http://webwiser.nlm.nih.gov/getHomeData.do.

Scenario Overview: This training scenario will demonstrate how to use WISER’s “help identify” feature to narrow down the possible identity of an unknown substance based on the physical properties of the substance and the symptoms of the exposed workers.

The scenario involves an incident at a warehouse where drums are leaking an unknown substance and exposed workers have been affected. The scene has been cleared of exposed workers and the situation stabilized. You are part of a team consisting of a HAZMAT specialist and skilled support personnel who have been asked to identify the contents of the leaking drums and provide information and recommendations to the Incident Commander.

The substance in question has been described as a colorless liquid with an alcohol-like smell.

1. Open the WISER application or website and
2. Select “Help Identify Chemical”.
3. Select “Properties” then select “State” and indicate that the unknown is a liquid.
4. Return to the list of properties, select “Color”, and indicate that the substance is colorless.
5. Return to the list of properties, select “Odor”, and indicate that the substance has an alcohol-like odor.
Now the list of likely chemicals has been narrowed from 438 to 31.

The workers from the warehouse are showing symptoms of nausea, dizziness, headache, and eye irritation.

1. Select “Symptoms” then select “Gastro/Urinary”. This can be accomplished by clicking on the stomach area of the human body image or by using the list of symptom categories (the list icon in the lower right corner of the application) and selecting “Gastro/Urinary”.

2. From the “Gastro/Urinary” list, select “nausea”.

3. Return to the human body image or the list of symptom categories and select “Neurological”. Select “dizziness” and “headache” from the list of neurological symptoms.

4. Return to the human body image or the list of symptom categories and select “Eyes”. Select “Eye irritation/redness” from the list of eye symptoms.

5. Tap on “Results” at the bottom of the mobile application or click on “Results” on the left hand side of the website.

After entering physical properties of the substance and the symptoms of the workers, the list of likely chemicals has been narrowed to 11 substances.

You see an NFPA label on the barrels indicating the substance is serious (3) flammability hazard.

1. Select “NFPA 704,” click on the red diamond, then select “3 – Serious”.

2. Tap on “Results” at the bottom of the mobile application or click on “Results” on the left hand side of the website.

The results list has been reduced to 3 potential substances.
The “Group By” feature allows the results list to be grouped by any of the property and symptom categories, as well as NFPA 704 categories and the supported substance categorizations (WMDs, meth lab, chemical weapons precursors, DOT hazard classifications). This allows you to identify a property, symptom, or other piece of information that would help you eliminate a number of potential substance.

The HAZMAT specialist on your team uses a hydrometer to determine that the substance floats on water so you know that it’s specific gravity is less than one.

1. While viewing the list of results, tap on the drawers icon in the upper right corner of the application, select group by “Property”, then “Specific Gravity”. You should see one substance that you can remove from the results because it sinks in water (specific gravity >1) and are left with two possible substances.

2. Tap and hold on the substance with a specific gravity greater than one for the option of removing it from the list.

This will likely be as far as you can narrow the list, and it is likely that you don’t need to go further. **The remaining substances are very similar alcohols with similar characteristics, effects, and handling procedures.** For example, they each reference the same DOT guidelines and the same or similar treatment information. Enough information is likely now known to recommend appropriate initial hazmat response procedures.