

# OSHA Briefing to Regional States LEPCs

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# Disaster Planning

## DISASTER PREPAREDNESS & RECOVERY PLAN

**Hazards** – Injuries can result from fire, fall from height, explosion, building collapse, and inability to egress a structure.

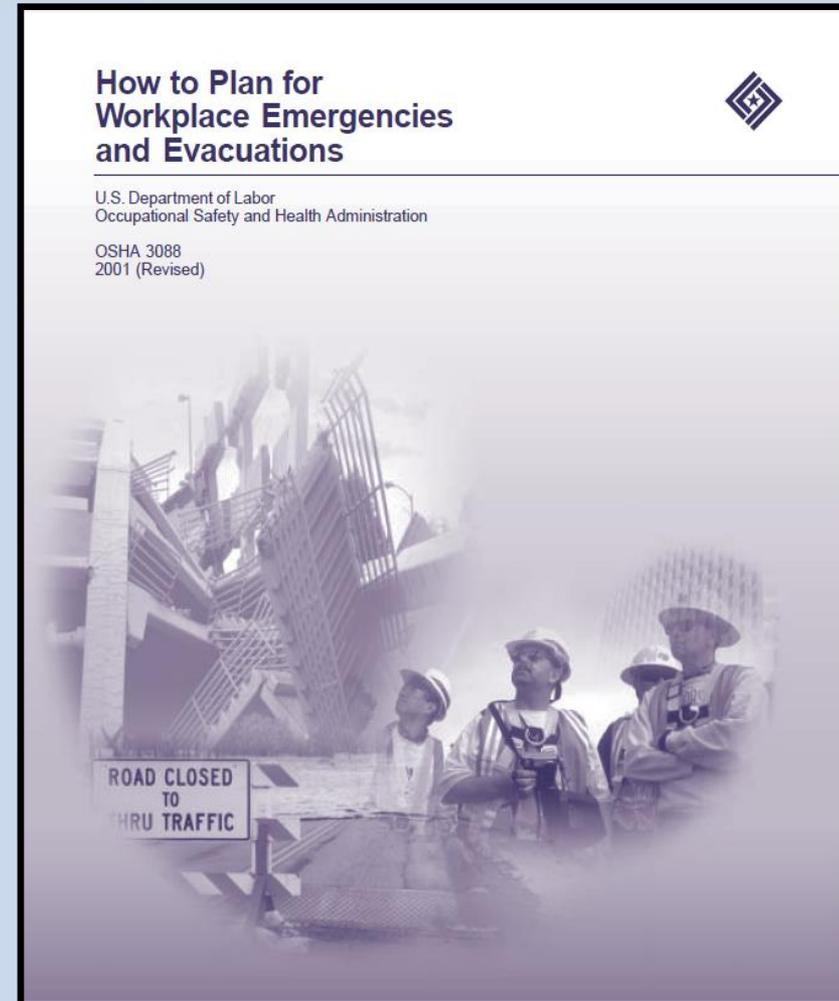
**Dalton, GA - January 6, 2007** – Fire at the Columbia Recycling Plant (664,000 sq. ft. Textile Recycling Facility)

- One (1) employee disoriented died from asphyxiation;
- Two (2) employees sustained burns / injuries - An unmarked door with panic hardware exposed employees to falls of approximately 12 to 13 feet;
- The door was not locked and it opened into thin air because the outside landing and stairway had been removed.

## Key Engineering Controls and Work Practices:

**Develop a Plan** –Webpage for Evacuations Plans & Procedures e-Tool:

- Do I need an Emergency Action Plan (EAP)?
- How do I write an EAP?



**OSHA 3088 2001 (Revised)**

# Emergency Preparedness and Response

## OSHA's Evacuation Plans / Procedures e-Tool

### DISASTER PREPAREDNESS & RECOVERY PLAN

**Develop a Plan** – <https://www.osha.gov/dts/weather/hurricane/preparedness.html> OSHA's Hurricane Preparedness and Response Webpage has many tools for use – Evacuations Plans & Procedures e-Tool

**Train and Drill** – Your Staff has to know what to do. A disaster preparedness and recovery plan should include employee training. It should address general training for all employees, including:

- Individual roles and responsibilities;
- Information about threats, hazards, and protective actions;
- Notification, warning and communications procedures;
- Means for locating family members;
- Emergency response procedures;
- Evacuation, shelter, and accountability procedures;
- Location and use of common emergency equipment;
- Emergency shutdown procedures.

Build emergency preparedness into the culture of the organization. Orientation sessions for new employees should include an overview of the contents and a copy of the preparedness manual.

# OSHA Evacuations Plan and Procedures e-Tool

<https://www.osha.gov/SLTC/etools/evacuation/expertsystem/emergencyplan.html>



UNITED STATES  
DEPARTMENT OF LABOR



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## eTools



# Evacuation Plans and Procedures eTool

[Home](#) [Emergency Action Plan](#) [Emergency Standards](#) [Expert Systems](#) [Additional Assistance](#)

This eTool\* will help small, low-hazard service or retail businesses implement an emergency action plan in compliance with OSHA's emergency standards.

- Do I need an Emergency Action Plan (EAP)?
- What is an EAP?
- How do I write my own EAP? **Create Your Own EAP**
- How do I evaluate my workplace to comply with OSHA's emergency standards?
- Where can I get additional assistance?

Does OSHA require you to have an EAP?  
[Create Your Own EAP](#)



Businesses that deal with hazardous substances (such as [Ethylene Oxide](#), [Methylenedianiline](#), or [Butadiene](#)), or that are subject to the provisions of the [Process Safety Management of Highly Hazardous Chemicals](#), [Hazardous Waste Operations](#), or [Grain Handling](#) standards may also need to develop an emergency action plan in compliance with [29 CFR 1910.38\(a\)](#). However, these businesses are beyond the scope of this eTool.

# OSHA Evacuations Plan and Procedures e-Tool

Occupational Safety & Health Administration

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eTools

## Evacuation Plans and Procedures eTool

Emergency Action Plan Emergency Standards Expert Systems Additional Assistance

Emergency Action Plan (EAP) » Create Your Own EAP

Step 1 Company Step 2 Alerts Step 3 Policy Step 4 Routes Step 5 Extinguishers Step 6 Operations Step 7 Duties Step 8 Assembly Step 9 Accounting Step 10 More...

**Alerts – Type Of ?**

**\*\*Policy – All Evacuate or ?**

**Routes – Standard Routes or ?**

**Extinguishers – Employees Use or ?**

Step 1 of 10

Company

Name:

Street Address:

City:

State:

Zip Code:

Company Contact

Name:

Title:

Telephone/Cell:

Email:

**\*\*Operations – How are Processes or Machinery Shut Down?**

**\*\*Duties – Standard Routes or ?**

**Assembly – Where?**

**Accounting – How?**

Next

# OSHA's "Role in Hurricane Katrina Response"

New Orleans Floods

Over 250 Billion gallons of water



# Hurricane Katrina Deaths

## **American Medical Association - Hurricane Katrina Disaster Mortuary Operational Response Team (DMORT) database - 2008**

Hurricane Katrina mortality data sources received in 2007, including Louisiana and out-of-state death certificates for deaths occurring from August 27 to October 31, 2005, and the Disaster Mortuary Operational Response Team's confirmed victims' database.

971 Katrina-related deaths in Louisiana and 15 deaths among Katrina evacuees in other states – Some of the major causes:

- Drowning (40%);
- Injury and Trauma (25%)
- Heart Conditions (11%)
- Forty-nine percent (49%) of victims were people 75 years old and older.
- Fifty-three percent (53%) of victims were men
- Fifty-one percent (51%) were black
- Forty-two (42%) were white
- People 75 years old and older were significantly more likely to be storm victims

# Hurricane Katrina Work-Related Events

## **NATIONAL CENSUS OF FATAL OCCUPATIONAL INJURIES IN 2005 - Bureau of Labor Statistics (BLS)**

A total of 29 work-related fatalities were attributable to hurricanes and their aftermath in 2005. Hurricane-related fatalities were concentrated in three States—Mississippi (10 fatalities), Louisiana (8 fatalities), and Florida (8 fatalities). Virtually all of the hurricane-related cases in Mississippi and Louisiana were attributed to Hurricane Katrina, while about half of fatal work injuries attributed to hurricanes in Florida were associated with Hurricane Wilma. Of the 29 cases identified by the fatality census, 9 involved workers who were struck by objects, 8 involved transportation-related incidents, and 5 resulted from falls.

## **New Orleans Police & Fire Department (Responder Injuries) – Centers for Disease Control (CDC) MMWR Weekly Report April 28, 2006 / 55/(16) / (456-458)**

Questionnaires were distributed to members of the New Orleans Police Department (NOPD) and New Orleans Fire Department (NOFD) 7--13 weeks after the hurricane.

- Upper respiratory and skin rash symptoms were the most common physical symptoms reported;
- Lacerations and sprains were the most common injuries;
- Depression/Exhaustion/Fatigue Factors - PTSD
- Approximately 1,200--1,400 police officers were on duty over the time period;
- 912 police officers completed the questionnaire;
- Approximately 525 (77%) fire fighters completed the questionnaire.



# Hazard Recognition Accident Scenarios

# Response Hazards – Struck-By/Entrapment

## Building Assessment, Restoration, and Demolition

### ***Structural Assessment***

**Hazards** - Structural instabilities, structural collapse, fire, explosion, entrapment under heavy and unstable debris.

**Employee Injuries: Elkton, MD– October 18, 2007** – Two (2) employees working at a jobsite performing demolition work were struck by a 24 ft. I-Beam. A sub-contractor on-site was using a trackhoe to tear down a 18 ft. high x 24 ft. wide canopy on the existing building. The I-Beam was dislodged by the trackhoe, and struck one employee causing stomach lacerations and a collapsed lung, the other employee received fractures to his arm and hip. The employees were hospitalized and treated.

### ***Key Engineering Controls and Work Practices***

- Limit access/set up controlled access zones until stability and structural integrity is known;
- Ensure that a competent person inspects building and floors before entry to perform work. A *competent person is able to recognize existing and predictable hazardous conditions and has the authority to take prompt corrective measures to eliminate the hazardous conditions;*
- Shore/brace walls and floors as needed to ensure safe work areas.

# Emergency Response Hazards

## Generators

### ***Generators***

**Hazards** – Carbon Monoxide poisoning, fire and electrical shock.

**Montgomery, AL - September 16, 2004** – A healthcare worker was providing in-home health care, when a portable generator was brought in, due to an impending hurricane – The generator was left running in a sunroom, creating carbon monoxide fumes - Healthcare worker, homeowner, and housekeeper, were all killed from carbon monoxide poisoning.

**Bakersfield CA - February 23, 2011** – An employee was installing a standby generator to provide electric power to a Square D distribution panel - The power distribution panel was energized - Conductors made contact with the energized buss bar causing a flash arc - Employee suffered 50% burns – Employee did not follow safe work practices and LO/TO procedures.

### **Key Engineering Controls and Work Practices**

- Never attempt to attach a generator directly to the electrical system (in place of distribution panel/meter) - If the structure's electrical system is not isolated, it may energize the utility's wiring system for great distances and create a risk of electrocution for electrical power distribution workers and others, in the area;
- Carbon monoxide (CO) is a poisonous, colorless, and odorless gas that is produced by the incomplete burning of the generator's fuel - CO displaces oxygen in the blood and deprives the heart, brain, and other vital organs of oxygen;

# Restoration Efforts Hazards

## Ladder Usage

### ***Business Reestablishment – Ladder Usage***

**Hazards** – *Fall from Heights, Struck-By, Contact with Electrical Conductors and Arc Flash.*

**Gretna, Louisiana- October 4, 2005** – An employee was working from an aluminum ladder installing a vinyl sign on a structure. The employee had tied off one side of an advertising sign and had subsequently moved the ladder to the opposite side of the sign to enable securing the opposite side. During the repositioning of the aluminum ladder, the ladder contacted an energized electrical service wire. The employee was electrocuted and fell approximately 15-feet to the parking lot below sustaining fatal injuries.

### **Key Engineering Controls and Work Practices**

- Locate overhead power lines before erecting a ladder;
- Avoid using a metal ladder near power lines or exposed energized electrical equipment;
- Assume that electrical lines are energized until proven otherwise. Lines and other conductors may become reenergized without warning as utilities are evaluated and restored after a disaster.
- Ensure proper distance from overhead electrical power lines and/or provide insulating barriers;
- If unable to ensure safe distance - Always follow Energy Isolation procedures (LO/TO).

# Restoration Efforts Hazards

## Fall From Heights or Through Openings

### ***Business Reestablishment – Roofing & Decking***

**Hazards** – Workers assessing or repairing roof structures are subject to numerous fall hazards, from weakened structures, missing guards, etc.

**Roofing Company Employee Falls Through Roof October 6, 2005** – An employee working from a roof structure accessed the west side of the roof, where the company was storing roofing materials. The employee stepped through a fiberglass skylight, that was not guarded. The employee fell approximately 31-feet to the floor below, and was fatally injured.

### ***Key Engineering Controls and Work Practices***

- Conduct survey's of the work area before starting work;
- Limit access/set up controlled access zones;
- Use dedicated observers;
- Cover or guard holes and openings (mark & label) as soon as they are created. Covers must support twice the weight (body, equipment, materials) that may be imposed.

# Recovery/Restoration Efforts Hazards

## Work Zone Hazards

**Hazards** – Caught-in-between, struck-by, and falls are common hazards found in and around Work Zones.

**Work Zone Fatality – Tampa, FL October 28, 2005** – An employee was placing traffic cones at the far edge of the berm/emergency lane of the roadway, within an established highway work zone, where the work crew was cleaning up hurricane debris. His vehicle was parked just off of the berm and a contractor's vehicle was parked in front of his location, half on the berm and half on the grassy area, with its flashing light operating. A motorist passed the contractor's vehicle, entered the berm/emergency lane, struck the employee, and continued off the roadway and into an areas with trees, never applying their brakes. The employee was fatally injured.

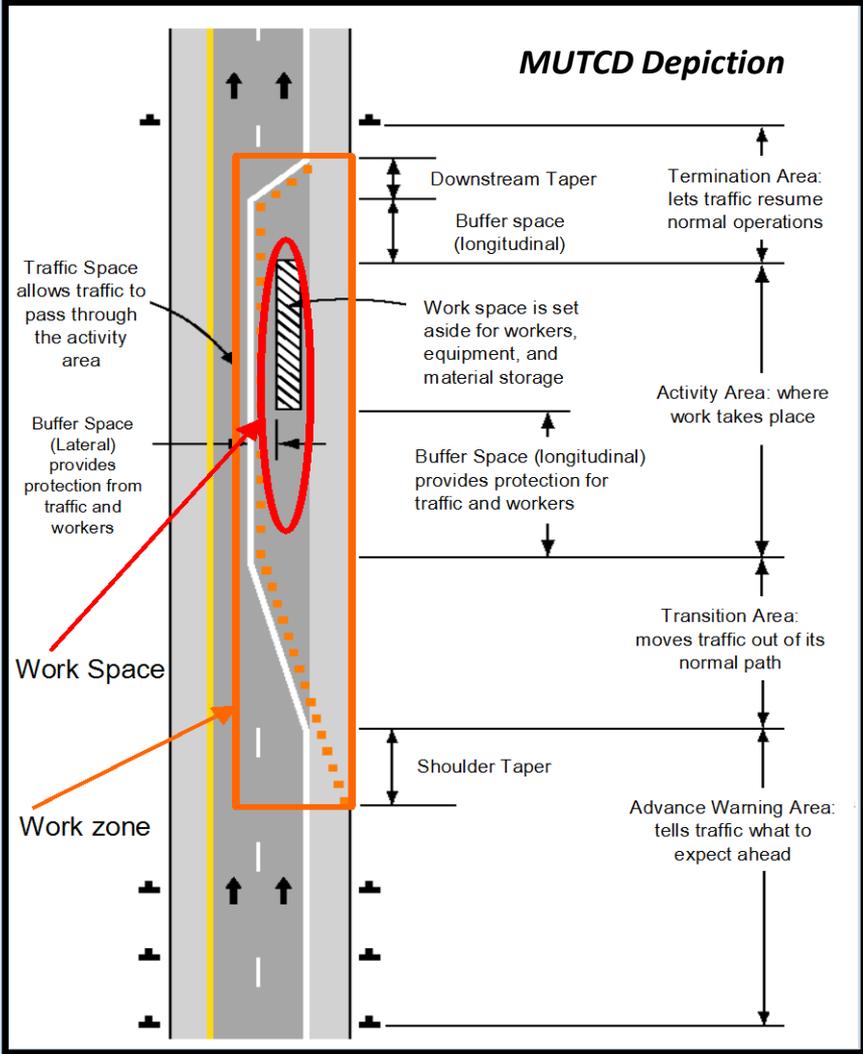
### ***Key Engineering Controls and Work Practices***

- Employers must ensure that they follow Part VI of the Manual on Uniform Traffic Control Devices (MUTCD);
- Ensure a traffic control plan for the movement of vehicles is completed;
- Ensure work zone protections, such as signal persons, concrete barriers, crash cushions are deployed to protect employees working on the work zone.

# Recovery Hazards – Work Zone Hazards



Photo Courtesy of [WorkzoneSafety.org](http://WorkzoneSafety.org)



# Response Hazards – Hydrogen Sulfide

## Salvage / Water Pumping Operations

**Hazards** – Fire, explosion, and potential inhalation of IDLH substances.

**Gulfport, MS – March 21, 2006** – Employees that worked for a marine salvage contractor were pumping water out of the compartments of a casino barge section that had been capsized during Hurricane Katrina, in preparation to salvage the barge. Employee #1 entered the aft compartment section of the barge and was asphyxiated by fumes, and drowned - Employee #2 began search for the Employee #1, when he spotted a hard hat and personal floatation vest laying next to the opening to the aft compartment section - Employee #2 inspected the compartment, identifying Employee #1 floating face down - Employee #2 shouted for a deckhand to call 911. Employee #2 then entered the section, and immediately became overcome by fumes and drowned - The supervisor stated that there was a strong smell of rotten eggs emanating from the compartment, when he arrived -The emergency services confined space team was called to the scene and entered the compartment after venting the space. Both employees bodies were recovered – Air monitoring later confirmed the presence of hydrogen sulfide.

### **Key Engineering Controls and Work Practices;**

- Ensure Testing of Spaces – Ensure required PPE, per the Safety Data Sheet (SDS), is used by all employees;
- Ensure workers are trained in Hazardous Communication (HAZCOM);
- Ensure hazardous sites and areas are mapped, especially potential IDLH sites.

# OSHA Heat Stress Safety Tool (Version II)

<https://itunes.apple.com/us/app/osha-heat-safety-tool/id469229784?mt=8>

The screenshot shows the OSHA Heat Safety Tool website. At the top, there is a navigation bar with the OSHA logo, the text "UNITED STATES DEPARTMENT OF LABOR", and a search box. Below this is a secondary navigation bar with "OSHA" and various links like "SHARE", "OSHA QuickTakes", "Newsletter", "RSS Feeds", and "Was this page helpful?". The main content area features the "Heat Safety Tool" title, a description by the U.S. Department of Labor, and two download buttons for "Android Market" and "iPhone". A blue box with an arrow points to the "Get Current" button on the app interface, with the text "Enter Temperature & Humidity or use 'Get Current' feature". Another blue box with an arrow points to the "Heat Index" and "Risk Level" output on the app, with the text "Produces \* Heat Index and Risk Level". A red box with an arrow points to the "Precautions" button on the app, with the text "View 'Precautions'". The app interface shows a temperature of 89°F and humidity of 80%, resulting in a Heat Index of 109.7°F and a Risk Level of HIGH. A red banner at the bottom of the app interface reads "Campaign to Prevent Heat Illness in Outdoor Workers". The website footer contains links for "Freedom of Information Act", "Privacy & Security Statement", "Disclaimers", "Important Web Site Notices", "International", and "Contact Us", along with the OSHA address and phone number.

UNITED STATES DEPARTMENT OF LABOR

OSHA

Occupational Safety & Health Administration

Heat Safety Tool

Android Market iPhone

By U.S. Department of Labor (DOL), Occupational Safety and Health Administration (OSHA)

When you're working in the heat, safety comes first. With the OSHA Heat Safety Tool, you have vital safety information available whenever and wherever you need it - right on your mobile phone.

The App allows workers and supervisors to calculate the **heat index** for their worksite, and, based on the heat index, displays a **risk level** to outdoor workers. Then, with a simple "click," you can get reminders about the **protective measures** that should be taken at that risk level to protect workers from heat-related illness-reminders about drinking enough fluids, scheduling rest breaks, planning for and knowing what to do in an emergency, adjusting work operations, gradually building up the workload for new workers, training on heat illness signs and symptoms, and monitoring each other for signs and symptoms of heat-related illness.

Working in full sunlight can increase heat index values by 15 degrees Fahrenheit. Keep this in mind and plan additional precautions for working in these conditions.

The OSHA Heat Tool is available in Spanish for Android and iPhone devices. To access the Spanish version on the iPhone, set the phone language setting to Spanish before downloading the app.

Stay informed and safe in the heat, check your risk level.

For more information about safety while working in the heat, see OSHA's [heat illness webpage](#), including new [online guidance](#) about using the heat index to protect workers.

The source code for this app is available for download:

- Android: [English \(ZIP\\*\)](#) | [Spanish \(ZIP\\*\)](#)
- iPhone: [All-in-One \(ZIP\\*\)](#)

OSHA Heat Safety Tool

Get Current Get Today Max

Or Enter Numbers:

Temperature 89 °F Humidity 80 % Calculate

Heat Index 109.7 °F

Risk Level HIGH

Precautions

Campaign to Prevent Heat Illness in Outdoor Workers

Produce \* Heat Index and Risk Level

View "Precautions"

\*Accessibility Assistance: Contact OSHA's [Directorate of Technical Support and Emergency Management](#) at (202) 693-2300 for assistance accessing PDF materials.

All other documents, that are not PDF materials or formatted for the web, are available as Microsoft Office® formats and videos and are noted accordingly. If additional assistance is needed with reading, reviewing or accessing these documents or any figures and illustrations, please also contact OSHA's [Directorate of Technical Support and Emergency Management](#) at (202) 693-2300.

\*\*eBooks - EPUB is the most common format for e-Books. If you use a Sony Reader, a Nook, or an iPad you can download the EPUB file format. If you use a Kindle, you can download the MOBI file format.

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U.S. Department of Labor | Occupational Safety & Health Administration | 200 Constitution Ave., NW, Washington, DC 20210  
Telephone: 800-321-OSHA (6742) | TTY: [www.OSHA.gov](http://www.OSHA.gov)

# Typical Hurricane / Tornado / Flood Response Hazards

## Some Activities During the Response

### Electrical

- Erection of Distribution Lines
  - Generators
- 
- Tree Trimming;
  - Vegetative Debris clean-up;
  - Burning of Vegetative Debris;
  - Discard of Animal carcasses and rotting meat;
  - Storm Wash Debris;
  - Roadway/Bridge Repairs;
  - Develop, implement, and monitor incident personal protective equipment (PPE) program.



# Response/Restoration Hazards

## Blue Tarps & Roofing Repairs

### Roof Inspection, Tarping and Repair

**Hazards** – *Fall from heights, slips, trips and falls, Improper ladder usage.*

#### Key Engineering Controls and Work Practices;

- Conduct survey's of the work area before starting work;
- Limit access/set up controlled access zones;
- Use dedicated observers;
- Use fall protection systems: guardrails, safety nets, or fall arrest system;
- Cover or guard holes and openings as soon as they are created. Covers must support twice the weight (body, equipment, materials) that may be imposed.
- When installing plastic sheeting on roofs, permanently mark areas where structural support is inadequate "Danger - No Step"



# Response/Restoration Hazards

## Burning of Vegetative Debris



# Response/Restoration Hazards

## Debris Stands Hazards



# Response/Restoration Hazards

## Heavy Equipment Hazards



# Response/Restoration Hazards

## USACE Debris Site



# Response/Restoration Hazards

## Twin Span Bridge Repair



# Response/Restoration Hazards

## Demolition in Lafitte, LA



# Response/Restoration Hazards

## Asbestos Containing Material (ACM) Roadside Collection



# Response/Restoration Hazards

## ACM Sorters at Debris Site



# Response/Restoration Hazards

## Work in Confined Spaces (Sewer & AGST)



# Response/Restoration Hazards

## Excavation / Trenching Hazards



# RECOVERY WORK - OSHA FACT SHEETS & QUICK CARDS

<https://www.osha.gov/pls/publications/publication.athruz?pType=Types&pID=2>

## OSHA Fact Sheet

### Demolition and Cleanup

Before starting a demolition, the person or persons in charge must adequately prepare for the task with regard to the health and safety of the workers. These preparatory operations involve the overall planning of the demolition job, including the methods to be used to bring the structure down, the equipment necessary to do the job, and the measures to be taken to perform the work safely. Before doing demolition work, inspect available personal protective equipment (PPE), and select, wear and use the PPE appropriate for the task.

Demolition work involves many of the same hazards associated with construction work. However, demolition also poses additional hazards due to unknown factors such as: deviations from the structure's original design, approved or unapproved modifications that altered the original design, materials hidden within structural members, and unknown strengths or weaknesses of damaged materials. To counter these unknowns, all personnel involved in a demolition project need to be fully aware of these types of hazards and the safety precautions available to control these hazards.

#### Preliminary Tasks

A written engineering survey must be performed on each structure being considered for demolition to determine the condition of the framing, floors and walls, and to assess the possibility of an unplanned collapse of any portion of the structure. Brace or shore the walls and floors of structures which have been damaged and which employees must enter. Inspect and maintain all stairs, passageways and ladders. Properly illuminate all stairways.

Shut off or cap all electric, gas, water, steam, sewer and other service lines outside the building line. Notify appropriate utility companies. Temporarily relocate and protect any essential power, water, or other utilities.

Determine the types of hazardous chemicals, gases, explosives, and flammable materials which have been used in any pipes, tanks, or other equipment on the property. Test and purge the hazardous chemicals, gases, explosives, or flammable materials. Survey for asbestos or other hazardous materials.

Guard wall openings to a height of 42 inches. Cover and secure floor openings with materi-

al able to withstand the loads likely to be imposed. Debris dropped through holes in the floor without the use of chutes must be completely enclosed with barricades not less than 42 inches high and not less than 6 feet back from the projected edge of the opening above. Floor openings used for material disposal must not be more than 25% of the total floor area. Use enclosed chutes with gates on the discharge end to drop material to the ground. Design and construct chutes that will withstand the loads likely to be imposed without failing.

Post signs at each level of structures, warning of the hazard of falling materials. Protect entrances to multi-story structures with sidewalk sheds or canopies for a minimum of 8 feet. Canopies must be at least 2 feet wider than the structure entrance and be able to hold a load of 150 lbs./sq. ft. Storage of material and debris must not exceed the allowable floor load.

#### Removing Walls and Masonry Sections

Demolition of exterior walls and floors must begin at the top of the structure and proceed downward. Masonry walls must not be permitted to fall on the floors of a building in

## OSHA Fact Sheet

### Working Safely Around Downed Electrical Wires

Electrical hazards exist in some form in nearly all occupations. However, those hazards multiply for workers involved in cleanup and recovery efforts following major disasters and weather emergencies. One particular life-threatening danger exists around downed and low-hanging electrical wires.

#### Safety First

Above all else, always consider all equipment, lines and conductors to be energized. Be cautious and if you notice downed wires or damaged electrical equipment, contact appropriate utility personnel. Remember that circuits do not always turn off when a power line falls into a tree or onto the ground. Even if they are not sparking or humming, fallen power lines can kill you if you touch them or even the ground nearby.

#### Energy

Downed wires can energize other objects, including fences, water pipes, bushes and trees, buildings, telephone/CATV/fiber optic cables and other electric utilities. Even man-hole castings and reinforcement bars (rebar) in pavement can become energized by downed wires. During storms, wind-blown objects such as canopies, aluminum roofs, siding, sheds, etc., can also be energized by downed wires.

#### Backfeed

When electrical conductors are inadvertently energized by other energy sources, backfeed occurs. Some of those sources include:

- Circuit ties/switch points
- Lightning
- Generators
- Downstream events

Simply testing for energy sources is not sufficient since hazardous electrical events can happen without warning. Ensure that proper lockout/tagout procedures are always followed.

#### Rules to live by

- Do NOT assume that a downed conductor is safe simply because it is on the ground or it is not sparking.
- Do NOT assume that all coated, weather-proof or insulated wire is just telephone, television or fiber-optic cable.
- Low-hanging wires still have voltage potential even if they are not touching the ground. So, "don't touch them." Everything is energized until tested to be de-energized.
- Never go near a downed or fallen electric power line. Always assume that it is energized. Touching it could be fatal.
- Electricity can spread outward through the ground in a circular shape from the point of contact. As you move away from the center, large differences in voltages can be created.
- Never drive over downed power lines. Assume that they are energized. And, even if they are not, downed lines can become entangled in your equipment or vehicle.
- If contact is made with an energized power line while you are in a vehicle, remain calm and do not get out unless the vehicle is on fire. If possible, call for help.
- If you must exit any equipment because of fire or other safety reasons, try to jump completely clear, making sure that you do not touch the equipment and the ground at the same time. Land with both feet together and shuffle away in small steps to minimize the path of electric current and avoid electrical shock. Be careful to maintain your balance.

## OSHA Fact Sheet

### Work Zone Traffic Safety

Transportation incidents and workers struck by vehicles or mobile equipment account for the highest number of fatal work injuries, according to the Bureau of Labor Statistics. Workers such as emergency responders, clean-up, utility, demolition, construction, and others in areas where there are moving vehicles and traffic are exposed to being struck-by moving vehicles. Work zones are used to move traffic in an approved direction and are typically identified by signs, cones, barrels, and barriers.

#### General

There must be a traffic control plan for the movement of vehicles in areas where there are also workers conducting other tasks. Drivers, workers on foot, and pedestrians must be able to see and understand the routes they are to follow. The authority in charge, Federal, state, or local, will determine the configuration of the temporary traffic control zone for motorists and pedestrians. The construction project manager will determine the internal traffic control plan within the construction/demolition worksite. When there are several projects, coordinated vehicle routes and communication between contractors will reduce vehicular struck-by incidents.

#### Signs

Standard highway signs for information, speed limits, and work zones will assist drivers in identifying, in designated traffic paths, such directives as: EVACUATION ROUTE; DO NOT ENTER; REDUCED SPEED AHEAD; ROAD CLOSED; and NO OUTLET. Using standard highway signs for internal construction worksite traffic control will assist workers in recognizing the route they are to use at the construction site.

#### Traffic Control Devices

Standard traffic control devices, signals, and message boards will instruct drivers to follow a path away from where work is being done. The authority in charge will determine the approved traffic control devices such as cones, barrels, barricades, and delineator

posts that will be used as part of the traffic control plan. These standard devices should also be used inside the work zone.

#### Work Zone Protections

Various styles of concrete, water, sand, collapsible barriers, crash cushions, and truck-mounted attenuators are available to limit motorist intrusions into the construction work zone.

#### Flagging

Flaggers and others providing temporary traffic control should wear high visibility clothing with a background of fluorescent orange-red or yellow-green and retroreflective material of orange, yellow, white, silver, or yellow-green. In areas of traffic movement, this personal protective equipment will make the worker visible for at least 1,000 feet, so that the worker can be seen from any direction, and make the worker stand out from the background. Check the label or packaging to ensure that the garments are performance class 2 or 3.

Drivers should be warned in advance with signs that there will be a flagger ahead. Flaggers should use STOP/SLOW paddles, paddles with lights, or flags (flags should be used only in emergencies.) The STOP sign should be octagonal with a red background and white letters and border. The SLOW sign is the same shape, with an orange background and black letters and a border.

# RECOVERY WORK - OSHA FACT SHEETS & QUICK CARDS

<https://www.osha.gov/pls/publications/publication.athruz?pType=Types&pID=2>



## Electrical Safety



Electrical hazards can cause burns, shocks and electrocution (death).

- Assume that all overhead wires are energized at deadly voltages. Never assume that a wire is safe to touch even if it is down or appears to be insulated.
- Never touch a fallen overhead power line. Call the electric utility company to report fallen electrical lines.
- Stay at least 10 feet (3 meters) away from overhead wires during cleanup and other activities. If working at heights or handling long objects, survey the area before starting work for the presence of overhead wires.
- If an overhead wire falls across your vehicle while you are driving, stay inside the vehicle and continue to drive away from the line. If the engine stalls, do not leave your vehicle. Warn people not to touch the vehicle or the wire. Call or ask someone to call the local electric utility company and emergency services.
- Never operate electrical equipment while you are standing in water.
- Never repair electrical cords or equipment unless qualified and authorized.
- Have a qualified electrician inspect electrical equipment that has gotten wet before energizing it.
- If working in damp locations, inspect electric cords and equipment to ensure that they are in good condition and free of defects, and use a ground-fault circuit interrupter (GFCI).
- Always use caution when working near electricity.

For more information:

**OSHA** Occupational Safety and Health Administration  
U.S. Department of Labor  
[www.osha.gov](http://www.osha.gov) (800) 321-OSHA (6742)

OSHA 3234-08-03



## Protecting Worker Safety and Health Under the National Response Framework

During a disaster, protecting response and recovery workers is essential for assuring a successful response and recovery. When large-scale disasters overwhelm State and local assets, the National Response Framework (NRF) Worker Safety and Health Support Annex can provide the technical assistance needed to help protect Federal, State, tribal, and local organizations' response and recovery workers. Depending upon the scope, complexity, and hazards associated with the incident, these services can include:

- Identifying and assessing worker health and safety hazards present at the incident site and in the environment.
- Assessing the resources needed to protect workers and identifying the sources available to meet these needs.
- Providing technical expertise in industrial hygiene, occupational safety and health, structural collapse engineering, safety engineering, radiation safety, biological and chemical agent response, and occupational medicine.
- Managing the creation and implementation of a site-specific health and safety plan (HASP).
- Monitoring and managing worker safety and health hazards through on-site identification, evaluation, analysis, and mitigation, including personal exposure monitoring.
- Providing assistance with developing, implementing, and monitoring the personal protective equipment (PPE) program, including the selection, use, and decontamination of PPE.
- Coordinating the collection and management of exposure and accident/injury data to identify trends and facilitate data sharing.
- Coordinating and providing incident-specific response and recovery worker training.
- Assisting with the development and distribution of educational materials on preventing and mitigating hazards.

For more complete information:

**OSHA** Occupational Safety and Health Administration  
U.S. Department of Labor  
[www.osha.gov](http://www.osha.gov) (800) 321-OSHA

OSHA 3801-03N-03



## Coordinating Responder Health and Safety

In the event of a major disaster, only the health and well-being of response and recovery workers can ensure that the victims themselves are cared for properly. When State, tribal, and local assets are overwhelmed and assistance is needed to protect employees during an emergency, FEMA can activate OSHA to coordinate employee safety and health. OSHA coordinates the resources and technical assistance provided under the NRF Worker Safety and Health Support Annex (see other side). Assistance can be requested through FEMA at a Joint Field Office and at FEMA's National and Regional Response Coordination Centers. When activated, OSHA will work within the incident command system to provide technical assistance to the site safety officer.

DOL/OSHA coordinates the activities of the Federal agencies that provide the core architecture for employee safety and health technical support during an all-hazards event or when otherwise directed.

Cooperating Agencies:

- Department of Defense
- Department of Energy
- Department of Health and Human Services
- Department of Homeland Security
- Environmental Protection Agency
- Other Responding Organizations

For further information on responder health and safety, please consult the NRF Worker Safety and Health Support Annex or for a list of resources available to response workers, please visit <http://www.osha.gov/SLTC/emergencypreparedness/index.html>.

For more complete information:

**OSHA** Occupational Safety and Health Administration  
U.S. Department of Labor  
[www.osha.gov](http://www.osha.gov) (800) 321-OSHA



## Chain Saw Safety

Operating a chain saw can be hazardous. Potential injuries can be minimized by using proper personal protective equipment and safe operating procedures.

### Before Starting a Chain Saw

- Check controls, chain tension, and all bolts and handles to ensure that they are functioning properly and that they are adjusted according to the manufacturer's instructions.
- Make sure that the chain is always sharp and that the oil tank is full.
- Start the saw on the ground or on another firm support. Drop starting is never allowed.
- Start the saw at least 10 feet from the fueling area, with the chain's brake engaged.

### Fueling a Chain Saw

- Use approved containers for transporting fuel to the saw.
- Dispense fuel at least 10 feet away from any sources of ignition when performing construction activities. **No smoking during fueling.**
- Use a funnel or a flexible hose when pouring fuel into the saw.
- Never attempt to fuel a running or HOT saw.

### Chain Saw Safety

- Clear away dirt, debris, small tree limbs and rocks from the saw's chain path. Look for nails, spikes or other metal in the tree before cutting.
- Shut off the saw or engage its chain brake when carrying the saw on rough or uneven terrain.
- Keep your hands on the saw's handles, and maintain balance while operating the saw.
- Proper personal protective equipment must be worn when operating the saw, which includes hand, foot, leg, eye, face, hearing and head protection.
- Do not wear loose-fitting clothing.
- Be careful that the trunk or tree limbs will not bind against the saw.
- Watch for branches under tension; they may spring out when cut.
- Gasoline-powered chain saws must be equipped with a protective device that minimizes chain saw kickback.
- Be cautious of saw kickback. To avoid kickback, do not saw with the tip. Keep tip guard in place.

For more complete information:

**OSHA** Occupational Safety and Health Administration  
U.S. Department of Labor  
[www.osha.gov](http://www.osha.gov) (800) 321-OSHA

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**Process Safety  
Management Accident  
Investigation Scenario**

# XXX Incorporated

- Gas Plant-vessel overpressure gas release ignited by an undetermined source initiating large fire
- Plant operators attempted to shut down the plant by activating the emergency shutdown system; but without success
- Emergency Shutdown Device (ESD) - One button did not work
- Plant operator and contractors evacuated the plant
- Fire continues for several hours; but fire extinguishing is not proposed

# XXX Incorporated

- Small Volunteer Fire Department and local sheriff responded to fire
- Plant staff and first responders monitor the event from a safe distance; from the Incident Command Center
- Plant manager requests volunteers and four plant staff volunteer to enter the facility and close manual activated valves controlling the inlet pipe line entering the plant
- Firefighters recommend that personnel not enter the plant due to the hazardous conditions and possibility of an explosion
- However, employees enter anyway without help from the fire dept.

# HAZWOPER REQUIREMENTS

- 1910.120(q)(1) An emergency response plan shall be developed and implemented to handle anticipated emergencies prior to the commencement of emergency response operations. The plan shall be in writing.
- Employers who will evacuate their employees from the danger area when an emergency occurs, and who do not permit any of their employees to assist in handling the emergency, are exempt from the requirements of this paragraph if they provide an emergency action plan in accordance with 29 CFR 1910.38.
- 1910.120(q)(2)(i) The employer shall develop an emergency response plan for emergencies which includes pre-emergency planning and coordination with outside parties.

# YYY incorporated

- Food Manufacturer-maintenance employee working on valve on a vessel breaks valve resulting in the release of carbon dioxide in a Room-6 within a building.
- Maintenance employee goes to control room to inform operator that there is a CO2 leak in Room-6
- CO2 alarm alarms is going off indicating a CO2 level of at least 3.0 %
- Operator informed shift supervisor who then told the operator he was headed to the room and to have someone bring him an SCBA-respirator
- Plant evacuation was issued by the facility-plant manager

# YYY Incorporated

- Maintenance personnel brought the SCBA to the room but could not find the shift supervisor.
- Unit manager instructed employees to assemble fire brigade for search and rescue and to notify fire department.
- Fire Department finds shift supervisor motionless on sixth floor; removes him from the area and attempts to revive him without success.
- With assistance of plant employee, fire department enters an area adjacent to Room 6 and shuts off valve stopping release of CO<sub>2</sub>.

# HAZWOPER REQUIREMENTS

- 1910.120(q)(3)(iv) Employees engaged in emergency response and exposed to hazardous substances presenting an inhalation hazard or potential inhalation hazard shall wear positive pressure self-contained breathing apparatus while engaged in emergency response, until such time that the individual in charge of the ICS determines through the use of air monitoring that a decreased level of respiratory protection will not result in hazardous exposures to employees.
- 1910.120(q)(3)(v) The individual in charge of the ICS shall limit the number of emergency response personnel at the emergency site, in those areas of potential or actual exposure to incident or site hazards, to those who are actively performing emergency operations. However, operations in hazardous areas shall be performed using the buddy system in groups of two or more.

# Hazardous Waste Operations & Emergency Response Training Requirements

## 29 CFR 1910.120(q)(6) - Training

Training shall be based on the duties and function to be performed by each responder of an emergency response organization.

**Trainers.** Trainers who teach any of the above training subjects shall have satisfactorily completed a training course for teaching the subjects they are expected to teach.

**Refresher training.** Employees shall receive annual refresher training to maintain their competencies at least yearly.

Types of Training Include:

- *First responder awareness level*
- *First responder operations level*
- *Hazardous materials technician*
- *Hazardous materials specialist*
- *On scene incident commander*

# HAZWOPER Training “Breakdown”

## Training Requirements – Emergency Response Operations

### Emergency Responders [1910.120(q)(6)]

<ul style="list-style-type: none"> <li>• <b>First Responder Awareness Level</b> (Witnesses or discovers a release of hazardous substances and is trained to notify the proper authorities)</li> </ul>	<p>Sufficient initial training and competencies Annual refresher</p>
<ul style="list-style-type: none"> <li>• <b>First Responder Operations Level</b> (Responds to the releases of hazardous substances in a defensive manner, without trying to stop the release)</li> </ul>	<p>8 hours initial training and competencies Annual refresher</p>
<ul style="list-style-type: none"> <li>• <b>Hazardous Materials Technician</b> (Responds aggressively to stop the release of hazardous substances)</li> </ul>	<p>24 hours initial training and competencies Annual refresher</p>
<ul style="list-style-type: none"> <li>• <b>Hazardous Materials Specialist</b> (Responds with and in support of HAZMAT technicians, but who have specific knowledge of various hazardous substances)</li> </ul>	<p>24 hours initial training and competencies Annual refresher</p>
<ul style="list-style-type: none"> <li>• <b>On Scene Incident Commander</b> (Assumes control of the incident scene beyond the first responder awareness level)</li> </ul>	<p>24 hours initial training and competencies Annual refresher</p>

OSHA's Site for Emergency Preparedness & Response  
<https://www.osha.gov/SLTC/emergencypreparedness>

# Questions??

**CONTACT INFO:**

OSHA Region VI

Main Office Number: 972-850-4145

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