

# Emergency Preparedness Planning

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| <b>Tentative Agenda</b>               |   |
|---------------------------------------|---|
| <b>Topic/lesson</b>                   | <b>Additional Information</b>                                 |
| Course Introduction                   | What do you expect to get out of this class?                  |
| Why Plan for an Emergency             | Brainstorming exercise  |
| OSHA Requirements                     |   |
| All Hazard Approach                   | Different types of emergencies to be identified               |
| Assess Risk/Assign Probability        | Risk vulnerability chart exercise                             |
| Plan Accordingly (prevention)         | Brainstorming exercise  |
| Guest Speaker                         | Emergency Management Agency                                   |
| Start the Plan                        | Visitor handouts  |
| Start the Plan Laptop Group Exercises | Group exercise using laptops for research                     |
| Worse Possible Scenarios              | Worse case scenario exercise; video clips                     |
| Selling to Management                 | Brainstorming exercise  |
| Testing and revising your plan        |   |
| Summary                               | Take what you have learned and create a next steps to do list |

## Resources Available from the Division of Safety & Hygiene (DSH) Libraries

(800) 644-6292 (614) 466-7388

[library@bwc.state.oh.us](mailto:library@bwc.state.oh.us)

[www.ohiobwc.com](http://www.ohiobwc.com)

### Safety training:

- Safety talks, outlines and scripts - DSH Safety leader's discussion guide, Training Center's One-hour safety presentations, reference books, web resources
- Videos – hundreds of safety and health topics
- Books and articles on training techniques

### Machine and equipment safety:

- Safety standards (ANSI, NFPA, CGA)
- Books and articles on power presses, material handling equipment, lockout/tagout, etc.

### Sample written programs:

- DSH program profiles and sample written programs
- Reference books
- Internet resources

### Illness and injury statistics:

- Statistics from the U.S. Bureau of Labor Statistics
- National Safety Council's *Injury Facts*
- National Institute of Occupational Safety & Health (NIOSH) studies

### Hazard communication and chemical safety:

- Chemical safety information
- Material safety data sheets (MSDSs)
- Sample written programs
- Videos
- Internet resources

### Safety standards

- American National Standards Institute (ANSI) standards (including standards for construction, machinery and equipment, personal protective equipment)
- National Fire Protection Association (NFPA) fire codes (including the Life Safety Code and the National Electrical Code)
- Compressed Gas Association (CGA) standards

### Other topics of interest (books, articles, magazines, videos and standards):

- Confined spaces
- Electrical safety
- Job safety analysis
- New employee orientation
- Powered industrial trucks
- Respiratory protection
- Scaffolds
- Spill response

Directories and lists of vendors of safety equipment

Occupational Safety & Health Administration (OSHA) regulations

*Manual of Uniform Traffic Control Devices (MUTCD)*

Recommendations of useful Internet sites

BWC publications

## **Saving You Time and Research**

Requests for copies of OSHA standards, information on starting a safety committee, a video on accident investigation techniques -- these are some of the thousands of inquiries BWC's Division of Safety & Hygiene (DSH) libraries receive each year.

### **DSH has two libraries to serve you:**

- The central library in the William Green Building in downtown Columbus;
- The resource center and video library located at the Ohio Center for Occupational Safety and Health (OCOSH) in Pickerington.

Both libraries are open 8 a.m. to 4:45 p.m., Monday through Friday. Your need for information does not require a visit to the library. You can phone, fax, or e-mail your requests and receive a quick response.

**The central library** provides free information services on the topics of occupational safety and health, workers' compensation and rehabilitation.

**The OCOSH resource center** provides similar services for those who visit OCOSH for meetings and training center classes.

**The video library** offers an extensive collection of videotapes to supplement your organization's safety and health training program. It is a convenient and popular source for Ohio employers to borrow quality occupational safety- and health-related training aids.

Visit our Web site at **[www.ohiobwc.com](http://www.ohiobwc.com)**.

Central Library  
30 W. Spring St., Third Floor  
Columbus OH 43215-2256  
**1-800-OHIOBWC**  
(614) 466-7388  
(614) 644-9634 (fax)  
[library@bwc.state.oh.us](mailto:library@bwc.state.oh.us)

OCOSH Resource Center  
13430 Yarmouth Drive  
Pickerington OH 43147  
**1-800-OHIOBWC**  
Resource center (614) 728-6464  
Video library (614) 644-0018





# EMERGENCY



# PREPAREDNESS

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# SIGN IN SHEET

Please check these for accuracy:

- \* Address
- \* Telephone number
- \* Company name
- \* E-mail address

Is everything spelled correctly?  
Don't forget your signature!

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# NAME TENT

Please WRITE  
your name

# BIG

(on both sides, please)

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# GENERAL OVERVIEW



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# BREAKROOM

- \* Pay Phones
- \* Message Board
- \* Coffee
- \* Vending Machines
- \* Refrigerator
- \* Can Recycling



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# CELL PHONES

| CELL CITATION   |  |
|---|--|
| <b>EVERYBODY CAN HEAR YOU NOW</b><br><small>By bothering those around you with your inconsiderate cell phone usage, you are contributing to toxicity, noise pollution, and dangerous distraction.</small> |  |
| <b>INFRACTION</b>   |  |
| <b>GENERAL</b>  | <b>RING</b>  |
| <input type="checkbox"/> Shouting/loudness  | <input type="checkbox"/> Annoying novelty ring       |
| <input type="checkbox"/> Lack of consideration  | <input type="checkbox"/> Overly loud ring            |
| <input type="checkbox"/> Disturbing the peace   | <input type="checkbox"/> Bad ringing judgment        |
| <input type="checkbox"/> Poor multi-tasking   | <input type="checkbox"/> Incessant ringing           |
| <b>CONVERSATION</b>   | <b>ENVIRONMENT</b>                                   |
| <input type="checkbox"/> Forced bystander listening   | <input type="checkbox"/> Disruptive for surroundings |
| <input type="checkbox"/> Talking too long   | <input type="checkbox"/> Invasion of personal space  |
| <input type="checkbox"/> Airing dirty laundry   | <input type="checkbox"/> Inappropriate location      |
| <input type="checkbox"/> Painfully banal subject(s)   | <input type="checkbox"/> Violating "NO CELL" rule    |
| <b>REMEDY</b>   |  |
| <input type="checkbox"/> Hang up  | <input type="checkbox"/> Consider others             |
| <input type="checkbox"/> Turn off ringer  | <input type="checkbox"/> Apologize                   |
|   | <input type="checkbox"/> Impound phone               |
|   | <input type="checkbox"/> Seek therapy                |

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## RESTROOMS



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## SMOKING AREA

Please respect our  
smoking policy

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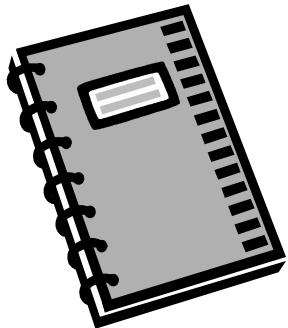
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## MANUAL



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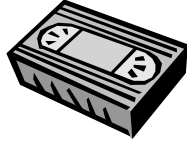
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## OCOSH LIBRARIES



Library



DVD and Video Library



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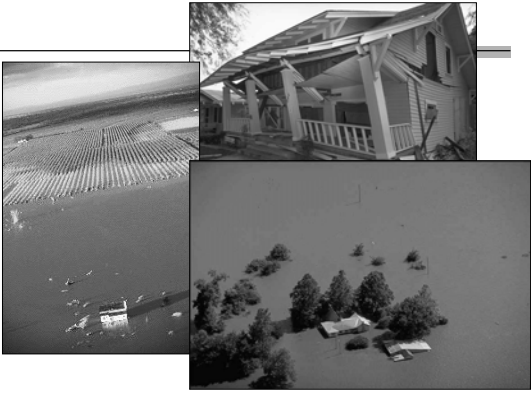
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## Why are we here?



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## COURSE OBJECTIVES

### You will Learn:

- ◆ An all-hazard approach to emergency planning
- ◆ Main components of an emergency plan
- ◆ Structured approach to emergency preparedness planning
- ◆ Skills to develop a plan

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## WORKPLACE EMERGENCY



An unforeseen situation that threatens your employees, customers, or the public, disrupts or shuts down your operations, or causes physical or environmental damage.

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**Imagine that a tornado strikes your community.  
What do you do?**



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## Why Plan for an Emergency or Crisis?

- Emergencies or crises of all shapes and sizes occur on a daily basis
- Emergencies or crises have significant impact
  - ▣ Physical
  - ▣ Emotional
  - ▣ Educational

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- ◆ Effective planning will reduce the level of chaos that occurs in an emergency
- ◆ Self-reliance:
  - ☞ In event of a significant emergency or crisis, reaction time is essential
  - ☞ Survival of your business entity

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## OSHA REQUIREMENTS




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## General Requirements for all Workplaces

- Emergency action plans (EAP)  
[29 CFR 1910.38] [29 CFR 1926.35] 
- Portable fire extinguishers  
[29 CFR 1910.157] 
- Fire detection systems  
[29 CFR 1910.164] 
- Fixed extinguishing systems  
[29 CFR 1910.160] [29 CFR 1926.150] 
- Fire prevention plans (FPP)  
[29 CFR 1910.39] [29 CFR 1926.151] 

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## General Requirements for all Workplaces

Design and construction requirements for exit routes

[29 CFR 1910.36]

Maintenance, safeguards, & operational features for exit routes

[29 CFR 1910.37]

Employee alarm systems

[29 CFR 1910.165]

Medical services & first aid

[29 CFR 1910.151][29 CFR 1926.50]



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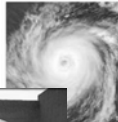
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## TYPES OF EMERGENCIES

- Natural
- Environmental
- Human Engineering
- Technical



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## NATURAL

- ♣ Fire
- ♣ Tornado
- ♣ Flood
- ♣ Severe Weather
- ♣ Earthquake
- ♣ Pandemics

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## Fire



- ◆ Housekeeping (prevention)
- ◆ Keep clear of emergency vehicles
- ◆ If possible report to the designated evacuation area for your building
- ◆ Account for building occupants

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## Tornado/Flood/Severe Weather



What to think about:

- ◆ Determine how you will be notified of a severe weather emergency
- ◆ Determine how you can quickly notify employees, contractors, and customers on premises
- ◆ Identify designated shelter area for your building



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## Pandemics: Influenza

- ◆ Annual deaths: 36,000\*
- ◆ Hospitalizations: >200,000\*

\* Average annual estimates during the 1990's

- ◆ Who is at greatest risk for serious complications?
  - ☞ persons 65 and older
  - ☞ persons with chronic diseases
  - ☞ infants
  - ☞ pregnant women
  - ☞ nursing home residents

Stats from OHIO Department of Health

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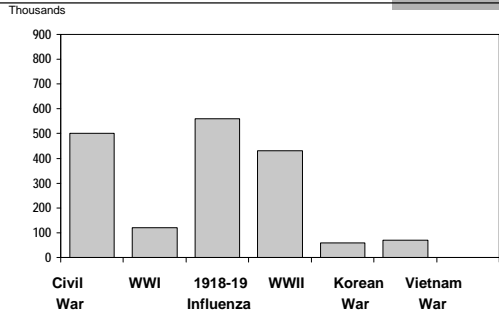
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### American Deaths from Influenza Compared to U.S. Servicemen Killed in any War



Stats from OHIO Department of Health

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### ENVIRONMENTAL

- Loss of Power
- Loss of Communications
- Hazardous Material Release
- Explosion

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### Loss of Power

- Identify and prioritize vital power dependent functions, operations, and equipment
- Plan ahead for short-term and long-term outages




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## Loss of Communications

- ◆ TELEPHONE SERVICE
- ◆ COMPUTERS
- ◆ RADIOS
- ◆ TELEVISION



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## Hazardous Material Release



Graniteville, SC Train Wreck

- ◆ Notification of Release
- ◆ Activation of Response Plans
- ◆ Evacuation or Shelter in place
- ◆ Stay upwind of the release (evacuation)

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## Explosion



- ◆ Identify and prevent conditions
- ◆ Properly store materials
- ◆ Labels should be well maintained and legible



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## Hazard Identification

- ◆ Labels and placards
- ◆ Material Safety Data Sheets (MSDS)
- ◆ Shipping papers



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## TECHNICAL

- Network Failure
- Software Failure
- Viruses
- Machinery Failure

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## Network and Software Failure / Viruses

- ◆ Have data recovery plans
- ◆ Consider policies to restrict removable storage devices
- ◆ Up to date virus protection
- ◆ Firewall

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## Machinery Failure

- ◆ Backup systems for critical machinery
- ◆ Trained personnel to operate machinery
- ◆ Emergency shut-down and evacuation procedures



Chernobyl 1986

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## HUMAN ENGINEERING

- ◆ Workplace Violence
- ◆ Sabotage/Arson
- ◆ Terrorism

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## Workplace Violence

- ◆ Create and enforce policy
- ◆ Site security
- ◆ Documentation



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## Sabotage/Arson

- Visitors log
- Closed circuit video
- Procedure to report suspicious behavior



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## Terrorism

Seven Signs of Terrorism (know them):

- Surveillance
- Elicitation
- Tests of Security
- Acquiring Supplies
- Suspicious People
- Dry Runs
- Getting into Position



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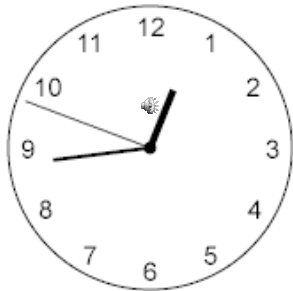
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## BREAK TIME



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## Categorize Business Processes

THERE ARE 3 LEVELS OF TOLERANCE:

- ◆ NECESSARY – function cannot be replaced by manual method
- ◆ SIGNIFICANT – function can be performed manually for a “brief” period of time
- ◆ MINOR – function can be interrupted for an extended period of time

Tolerance - ability to cope with the interruption expressed in: length of interruption, time of day, time of the year

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## Identifying and Prioritizing

1. WHO DO YOU GET THE INFORMATION FROM?
2. ASK THE RIGHT QUESTIONS

How would you keep that task going if interrupted for 8 hours, 24 hours, or 3 days?

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## How Will Your Business Survive?

- ◆ After a business interruption?
- ◆ If property damage occurs?
- ◆ At a remote location ?
- ◆ Loss of employees?



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### Risk Probability Chart

| Emergency Event | Probability (L) | Human Impact (L) | Property Impact (L) | Business Impact (L) | Internal/External Resources (L) | Total risk (L) |
|-----------------|-----------------|------------------|---------------------|---------------------|---------------------------------|----------------|
|                 |                 |                  |                     |                     |                                 |                |
|                 |                 |                  |                     |                     |                                 |                |
|                 |                 |                  |                     |                     |                                 |                |
|                 |                 |                  |                     |                     |                                 |                |
|                 |                 |                  |                     |                     |                                 |                |
|                 |                 |                  |                     |                     |                                 |                |
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|                 |                 |                  |                     |                     |                                 |                |
|                 |                 |                  |                     |                     |                                 |                |
|                 |                 |                  |                     |                     |                                 |                |
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|                 |                 |                  |                     |                     |                                 |                |

Example and Practice Charts are in Exercise Tab

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### Risk Probability Chart

- Emergency event
- Probability
- Human impact
- Property impact
- Business impact
- Internal/External resources

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### Risk Probability Chart

# exercise

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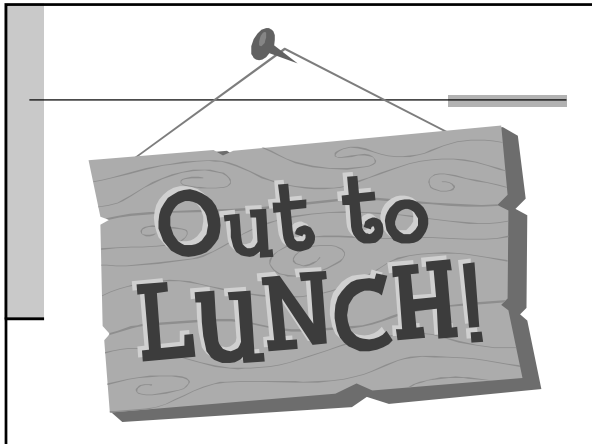
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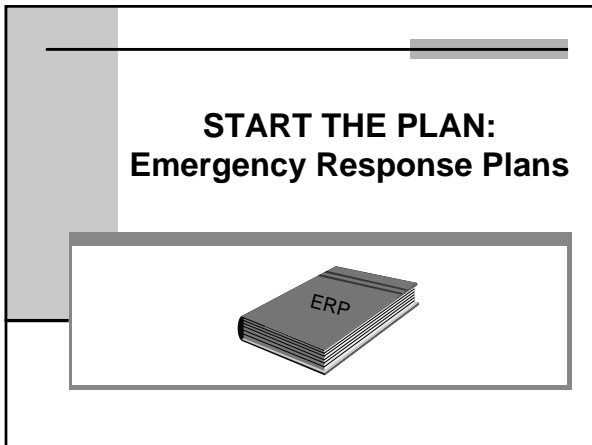
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**Writing Your Plan**

- ◆ Develop a checklist before you start the plan
- ◆ Mission Statement / Goals / Objectives
- ◆ Define types of emergency
- ◆ Emergency response plan
- ◆ Facilities / Property layout maps

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## Writing Your Plan (con't)

- ◆ Employee contact information
- ◆ Important contacts: OSHA, police, fire, etc.
- ◆ Aid agreements with outside sources
- ◆ Insurance policy/asset list
- ◆ Media relations
- ◆ Alternate facility

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## Vehicles

- ◆ Controlling all access points
- ◆ Vehicle inspection before access to the property
- ◆ Prevention of abandoned or suspicious vehicles
- ◆ Parked / Unfamiliar vehicles

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## Site Security and Control

- ◆ Boundary control measures (fences, security cameras and scheduled patrols)
- ◆ Control of all entry points within the facility



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## Emergency Evacuation Routes



- ◆ Have multiple evacuation routes
- ◆ Primary and Secondary
- ◆ Mark evacuation routes (Signage)

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## Suspicious Behaviors



Be Aware of and Report:

- ◆ People in buildings or areas who do not appear to be conducting legitimate business (loitering, etc.)
- ◆ Unauthorized personnel in restricted, sensitive or private areas
- ◆ Persons requesting sensitive information

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## Workplace Emergency Reporting and Alerting Employees

- ◆ Employees must know how to report emergencies
- ◆ "911" if applicable
- ◆ Local EMS numbers
- ◆ Appropriate internal reporting procedures



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## Vital Records: Protection and Retention

- ◆ Personnel information
- ◆ Financial
- ◆ Client
- ◆ Essential data



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## Building Safety

- ◆ Inspection after an emergency



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## FOUR ELEMENTS OF EMERGENCY MANAGEMENT



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**Element #1**

- ◆ Prevention
  - ▣ Identify risks/vulnerabilities
  - ▣ Implement preventive measures
  - ▣ Assess needs and resources
  - ▣ Identify stakeholders

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**Element #2**

- ◆ Preparedness
  - ▣ Work with community partners to develop appropriate emergency management policies and procedures
  - ▣ Clarify roles and responsibilities
  - ▣ Provide training
  - ▣ Conduct drills and exercises

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**Element #3**

- ◆ Response
  - ▣ Activate plan
  - ▣ Follow the leader
  - ▣ Document actions
  - ▣ Debriefing

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### Element #4

#### Recovery

- Mental Health/Emotional Recovery
  - Recognize that recovery is an ongoing process
  - Emphasize the importance of appropriate interventions
- Business recovery

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### FOUR GOALS OF AN EMERGENCY RESPONSE PLAN

- 1) Save Lives
- 2) Prevent Injuries
- 3) Protect Property
- 4) Protect the Environment

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In addition to being able to recognize what has already happened in an emergency, it is necessary to identify the potential for other problems.



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## OSHA WEBSITE




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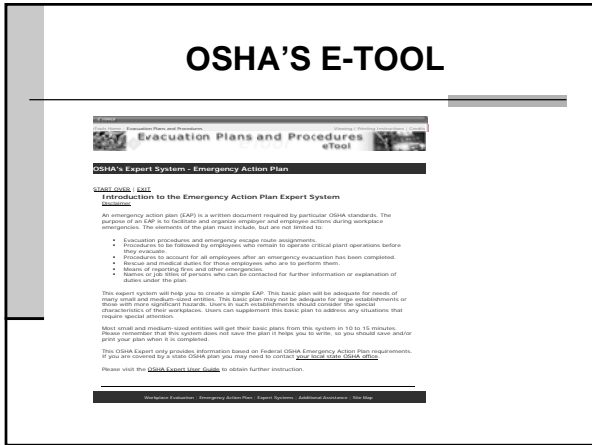
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## OSHA'S E-TOOL




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## WORSE CASE SCENARIO

### Class Exercise

You are the president / CEO of a business that sells food service supplies. Your company has 25 full time employees. The company is located within a business park. There are a wide range of industries within the park. You hear that a fire has started at a business that is located near your facility. You immediately send someone over to where the emergency has occurred. The employee returns and informs you the local response authorities have ordered a shelter in place. The shelter includes all of the business park along with other near by residential and business properties. Why do you need shelter in place? You have just received a call from the Emergency Management office. They communicated to you that further notice all businesses should be "Shelter in Place" The facility where the emergency is located manufactures Pool Chemicals. You find out that some Chlorine has escaped from their large above ground tank farm. The building has caught fire and other chemicals (such as corrosives and oxidizers) are involved in the emergency. The company where the emergency has occurred is close to your boundary line. The day is cloudy with a slight breeze to the south. You have noticed the flag is blowing to the south where your company entrance is located. Why would this emergency concern you? Your response plans include fire and weather related emergencies. Your company has food shipments to get to the customers. Should your response plans just include emergencies that happen at your facility? Why is important to understand and plan for other types of emergencies? Why is important to understand what neighborhood businesses could encounter? What agencies can you use to help find out critical information about companies within the community?

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## WORSE CASE SCENARIOS

Students read scenarios in groups and discuss amongst themselves “what went wrong” and “what could have been in the plan” to have helped during emergency

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## BREAK TIME



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## SELLING TO MANAGEMENT

*exercise*

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## SELLING TO MANAGEMENT

- ◆ Address the risks and exposures without a recovery plan
- ◆ Cost analysis
- ◆ Presentation



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## Address the Risks and Exposures

- ◆ Present risk analysis
- ◆ Tolerance of unplanned business interruption
- ◆ Additional benefits
- ◆ Legal requirements/OSHA



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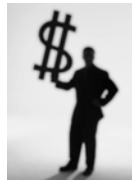
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## Cost Analysis

- ◆ Monetary value of tolerance levels
- ◆ Customer satisfaction
- ◆ Sales or services lost
- ◆ Media relations
- ◆ Legal obligations



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## Presentation



- ◆ Prior to meeting, disseminate plan for management review
- ◆ Refer to risk and cost analysis
- ◆ Focus on benefits
- ◆ Be prepared for questions



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## TESTING AND REVISING YOUR PLAN

- ◆ Rehearsals – it is not testing your plan during an emergency. Have a specified time period to have drills (every quarter/twice a year)
- ◆ Audits – how did the rehearsal go? Also, monthly hazard checks (exit signs/alarms)
- ◆ Evolving plan – revising your plan as your business changes (new warehouse or addition to building)

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## Pre-Planning /Testing your Plan

- ◆ Activate all aspects of the plan by using Table top or Hands-on Scenarios: Practice, Practice, Practice
- ◆ Invite other local, regional or state organizations to participate in the training exercise
- ◆ Always De-brief the training exercise
- ◆ Use continuous improvement methods

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| Plan Testing Chart              |     |     |     |     |     |     |     |     |     |     |     |     |
|---------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Drill Title                     |     |     |     |     |     |     |     |     |     |     |     |     |
| Date Scheduled                  |     |     |     |     |     |     |     |     |     |     |     |     |
| Date Completed                  |     |     |     |     |     |     |     |     |     |     |     |     |
| Purpose of Exercise             |     |     |     |     |     |     |     |     |     |     |     |     |
| Planning Event                  | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| Management Orientation & Review |     |     |     |     |     |     |     |     |     |     |     |     |
| Employee Orientation & Review   |     |     |     |     |     |     |     |     |     |     |     |     |
| Contractor Orientation & Review |     |     |     |     |     |     |     |     |     |     |     |     |
| Community Orientation & Review  |     |     |     |     |     |     |     |     |     |     |     |     |
| Management Table Top Ex.        |     |     |     |     |     |     |     |     |     |     |     |     |
| Response Team Table Top Ex.     |     |     |     |     |     |     |     |     |     |     |     |     |
| Walk-through Drill              |     |     |     |     |     |     |     |     |     |     |     |     |
| Functional Drill                |     |     |     |     |     |     |     |     |     |     |     |     |
| Evacuation Drill                |     |     |     |     |     |     |     |     |     |     |     |     |
| Full Scale Exercise             |     |     |     |     |     |     |     |     |     |     |     |     |
| Review & Evaluation             |     |     |     |     |     |     |     |     |     |     |     |     |
| Internal Resources              |     |     |     |     |     |     |     |     |     |     |     |     |
| External Resources              |     |     |     |     |     |     |     |     |     |     |     |     |
| Drill Control Resources         |     |     |     |     |     |     |     |     |     |     |     |     |
| Media Interest                  |     |     |     |     |     |     |     |     |     |     |     |     |
| Community Interest              |     |     |     |     |     |     |     |     |     |     |     |     |

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## SUMMARY

- There is no one-size-fits-all approach to emergency response
- Training and practice are essential for the successful implementation of crisis response plans
- All employees should be trained on appropriate crisis response policies and procedures
- Emergency management occurs at multiple levels – business, local, federal, and personal

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## QUESTIONS??

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## STANDARDS

## STANDARDS Referenced in PowerPoint

### §1910.38 Emergency action plans.

(a) *Application.* An employer must have an emergency action plan whenever an OSHA standard in this part requires one. The requirements in this section apply to each such emergency action plan.

(b) *Written and oral emergency action plans.* An emergency action plan must be in writing, kept in the workplace, and available to employees for review. However, an employer with 10 or fewer employees may communicate the plan orally to employees.

(c) *Minimum elements of an emergency action plan.* An emergency action plan must include at a minimum:

- (1) Procedures for reporting a fire or other emergency;
- (2) Procedures for emergency evacuation, including type of evacuation and exit route assignments;
- (3) Procedures to be followed by employees who remain to operate critical plant operations before they evacuate;
- (4) Procedures to account for all employees after evacuation;
- (5) Procedures to be followed by employees performing rescue or medical duties; and
- (6) The name or job title of every employee who may be contacted by employees who need more information about the plan or an explanation of their duties under the plan.

(d) *Employee alarm system.* An employer must have and maintain an employee alarm system. The employee alarm system must use a distinctive signal for each purpose and comply with the requirements in §1910.165.

(e) *Training.* An employer must designate and train employees to assist in a safe and orderly evacuation of other employees.

(f) *Review of emergency action plan.* An employer must review the emergency action plan with each employee covered by the plan:

- (1) When the plan is developed or the employee is assigned initially to a job;
- (2) When the employee's responsibilities under the plan change; and

(3) When the plan is changed.

### **§1926.35 Employee emergency action plans.**

(a) *Scope and application.* This section applies to all emergency action plans required by a particular OSHA standard. The emergency action plan shall be in writing (except as provided in the last sentence of paragraph (e)(3) of this section) and shall cover those designated actions employers and employees must take to ensure employee safety from fire and other emergencies.

(b) *Elements.* The following elements, at a minimum, shall be included in the plan:

(1) Emergency escape procedures and emergency escape route assignments;

(2) Procedures to be followed by employees who remain to operate critical plant operations before they evacuate;

(3) Procedures to account for all employees after emergency evacuation has been completed;

(4) Rescue and medical duties for those employees who are to perform them;

(5) The preferred means of reporting fires and other emergencies; and

(6) Names or regular job titles of persons or departments who can be contacted for further information or explanation of duties under the plan.

(c) *Alarm system.* (1) The employer shall establish an employee alarm system which complies with §1926.159.

(2) If the employee alarm system is used for alerting fire brigade members, or for other purposes, a distinctive signal for each purpose shall be used.

(d) *Evacuation.* The employer shall establish in the emergency action plan the types of evacuation to be used in emergency circumstances.

(e) *Training.* (1) Before implementing the emergency action plan, the employer shall designate and train a sufficient number of persons to assist in the safe and orderly emergency evacuation of employees.

(2) The employer shall review the plan with each employee covered by the plan at the following times:

(i) Initially when the plan is developed,

(ii) Whenever the employee's responsibilities or designated actions under the plan change, and

(iii) Whenever the plan is changed.

(3) The employer shall review with each employee upon initial assignment those parts of the plan which the employee must know to protect the employee in the event of an emergency. The written plan shall be kept at the workplace and made available for employee review. For those employers with 10 or fewer employees the plan may be communicated orally to employees and the employer need not maintain a written plan.

### **§1910.157 Portable fire extinguishers.**

(a) *Scope and application.* The requirements of this section apply to the placement, use, maintenance, and testing of portable fire extinguishers provided for the use of employees. Paragraph (d) of this section does not apply to extinguishers provided for employee use on the outside of workplace buildings or structures. Where extinguishers are provided but are not intended for employee use and the employer has an emergency action plan and a fire prevention plan that meet the requirements of 29 CFR 1910.38 and 29 CFR 1910.39 respectively, then only the requirements of paragraphs (e) and (f) of this section apply.

(b) *Exemptions.* (1) Where the employer has established and implemented a written fire safety policy which requires the immediate and total evacuation of employees from the workplace upon the sounding of a fire alarm signal and which includes an emergency action plan and a fire prevention plan which meet the requirements of 29 CFR 1910.38 and 29 CFR 1910.39 respectively, and when extinguishers are not available in the workplace, the employer is exempt from all requirements of this section unless a specific standard in part 1910 requires that a portable fire extinguisher be provided.

(2) Where the employer has an emergency action plan meeting the requirements of §1910.38 which designates certain employees to be the only employees authorized to use the available portable fire extinguishers, and which requires all other employees in the fire area to immediately evacuate the affected work area upon the sounding of the fire alarm, the employer is exempt from the distribution requirements in paragraph (d) of this section.

(c) *General requirements.* (1) The employer shall provide portable fire extinguishers and shall mount, locate and identify them so that they are readily accessible to employees without subjecting the employees to possible injury.

(2) Only approved portable fire extinguishers shall be used to meet the requirements of this section.

(3) The employer shall not provide or make available in the workplace portable fire extinguishers using carbon tetrachloride or chlorobromomethane extinguishing agents.

(4) The employer shall assure that portable fire extinguishers are maintained in a fully charged and operable condition and kept in their designated places at all times except during use.

(5) The employer shall remove from service all soldered or riveted shell self-generating soda acid or self-generating foam or gas cartridge water type portable

fire extinguishers which are operated by inverting the extinguisher to rupture the cartridge or to initiate an uncontrollable pressure generating chemical reaction to expel the agent.

(d) *Selection and distribution.* (1) Portable fire extinguishers shall be provided for employee use and selected and distributed based on the classes of anticipated workplace fires and on the size and degree of hazard which would affect their use.

(2) The employer shall distribute portable fire extinguishers for use by employees on Class A fires so that the travel distance for employees to any extinguisher is 75 feet (22.9 m) or less.

(3) The employer may use uniformly spaced standpipe systems or hose stations connected to a sprinkler system installed for emergency use by employees instead of Class A portable fire extinguishers, provided that such systems meet the respective requirements of §1910.158 or §1910.159, that they provide total coverage of the area to be protected, and that employees are trained at least annually in their use.

(4) The employer shall distribute portable fire extinguishers for use by employees on Class B fires so that the travel distance from the Class B hazard area to any extinguisher is 50 feet (15.2 m) or less.

(5) The employer shall distribute portable fire extinguishers used for Class C hazards on the basis of the appropriate pattern for the existing Class A or Class B hazards.

(6) The employer shall distribute portable fire extinguishers or other containers of Class D extinguishing agent for use by employees so that the travel distance from the combustible metal working area to any extinguishing agent is 75 feet (22.9 m) or less. Portable fire extinguishers for Class D hazards are required in those combustible metal working areas where combustible metal powders, flakes, shavings, or similarly sized products are generated at least once every two weeks.

(e) *Inspection, maintenance and testing.* (1) The employer shall be responsible for the inspection, maintenance and testing of all portable fire extinguishers in the workplace.

(2) Portable extinguishers or hose used in lieu thereof under paragraph (d)(3) of this section shall be visually inspected monthly.

(3) The employer shall assure that portable fire extinguishers are subjected to an annual maintenance check. Stored pressure extinguishers do not require an internal examination. The employer shall record the annual maintenance date and retain this record for one year after the last entry or the life of the shell, whichever is less. The record shall be available to the Assistant Secretary upon request.

(4) The employer shall assure that stored pressure dry chemical extinguishers that require a 12-year hydrostatic test are emptied and subjected to applicable maintenance procedures every 6 years. Dry chemical extinguishers having non-refillable disposable containers are exempt from this requirement. When recharging or hydrostatic testing is performed, the 6-year requirement begins from that date.

(5) The employer shall assure that alternate equivalent protection is provided when portable fire extinguishers are removed from service for maintenance and recharging.

(f) *Hydrostatic testing.* (1) The employer shall assure that hydrostatic testing is performed by trained persons with suitable testing equipment and facilities.

(2) The employer shall assure that portable extinguishers are hydrostatically tested at the intervals listed in Table L-1 of this section, except under any of the following conditions:

(i) When the unit has been repaired by soldering, welding, brazing, or use of patching compounds;

(ii) When the cylinder or shell threads are damaged;

(iii) When there is corrosion that has caused pitting, including corrosion under removable name plate assemblies;

(iv) When the extinguisher has been burned in a fire; or

(v) When a calcium chloride extinguishing agent has been used in a stainless steel shell.

(3) In addition to an external visual examination, the employer shall assure that an internal examination of cylinders and shells to be tested is made prior to the hydrostatic tests.

Table L-1

| interval<br>(years) | Type of extinguishers   | Test  |
|---------------------|---|-------|
|                     | Soda acid (soldered brass shells) (until 1/1/82).....                                   | (\1\) |
|                     | Soda acid (stainless steel shell).....  | 5     |
|                     | Cartridge operated water and/or antifreeze.....   | 5     |
|                     | Stored pressure water and/or antifreeze.....  | 5     |
|                     | Wetting agent.....  | 5     |
|                     | Foam (soldered brass shells) (until 1/1/82).....  | (\1\) |
|                     | Foam (stainless steel shell).....   | 5     |
|                     | Aqueous Film Forming foam (AFFF).....   | 5     |
|                     | Loaded stream.....  | 5     |
|                     | Dry chemical with stainless steel.....  | 5     |
|                     | Carbon dioxide.....   | 5     |
|                     | Dry chemical, stored pressure, with mild steel, brazed brass<br>or aluminum shells..... | 12    |
|                     | Dry chemical, cartridge or cylinder operated, with mild steel<br>shells.....            | 12    |

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|--|----|
| Halon 1211.....  | 12 |
| Halon 1301.....  | 12 |
| Dry powder, cartridge or cylinder operated with mild steel shells..... | 12 |

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\1\ Extinguishers having shells constructed of copper or brass joined by soft solder or rivets shall not be hydrostatically tested and shall be removed from service by January 1, 1982. (Not permitted)

(4) The employer shall assure that portable fire extinguishers are hydrostatically tested whenever they show new evidence of corrosion or mechanical injury, except under the conditions listed in paragraphs (f)(2)(i)-(v) of this section.

(5) The employer shall assure that hydrostatic tests are performed on extinguisher hose assemblies which are equipped with a shut-off nozzle at the discharge end of the hose. The test interval shall be the same as specified for the extinguisher on which the hose is installed.

(6) The employer shall assure that carbon dioxide hose assemblies with a shut-off nozzle are hydrostatically tested at 1,250 psi (8,620 kPa).

(7) The employer shall assure that dry chemical and dry powder hose assemblies with a shut-off nozzle are hydrostatically tested at 300 psi (2,070 kPa).

(8) Hose assemblies passing a hydrostatic test do not require any type of recording or stamping.

(9) The employer shall assure that hose assemblies for carbon dioxide extinguishers that require a hydrostatic test are tested within a protective cage device.

(10) The employer shall assure that carbon dioxide extinguishers and nitrogen or carbon dioxide cylinders used with wheeled extinguishers are tested every 5 years at 5/3 of the service pressure as stamped into the cylinder. Nitrogen cylinders which comply with 49 CFR 173.34(e)(15) may be hydrostatically tested every 10 years.

(11) The employer shall assure that all stored pressure and Halon 1211 types of extinguishers are hydrostatically tested at the factory test pressure not to exceed two times the service pressure.

(12) The employer shall assure that acceptable self-generating type soda acid and foam extinguishers are tested at 350 psi (2,410 kPa).

(13) Air or gas pressure may not be used for hydrostatic testing.

(14) Extinguisher shells, cylinders, or cartridges which fail a hydrostatic pressure test, or which are not fit for testing shall be removed from service and from the workplace.



(15)(i) The equipment for testing compressed gas type cylinders shall be of the water jacket type. The equipment shall be provided with an expansion indicator which operates with an accuracy within one percent of the total expansion or .1cc (.1mL) of liquid.

(ii) The equipment for testing non-compressed gas type cylinders shall consist of the following:

(A) A hydrostatic test pump, hand or power operated, capable of producing not less than 150 percent of the test pressure, which shall include appropriate check valves and fittings;

(B) A flexible connection for attachment to fittings to test through the extinguisher nozzle, test bonnet, or hose outlet, as is applicable; and

(C) A protective cage or barrier for personal protection of the tester, designed to provide visual observation of the extinguisher under test.

(16) The employer shall maintain and provide upon request to the Assistant Secretary evidence that the required hydrostatic testing of fire extinguishers has been performed at the time intervals shown in Table L-1. Such evidence shall be in the form of a certification record which includes the date of the test, the signature of the person who performed the test and the serial number, or other identifier, of the fire extinguisher that was tested. Such records shall be kept until the extinguisher is hydrostatically retested at the time interval specified in Table L-1 or until the extinguisher is taken out of service, whichever comes first.

(g) *Training and education.* (1) Where the employer has provided portable fire extinguishers for employee use in the workplace, the employer shall also provide an educational program to familiarize employees with the general principles of fire extinguisher use and the hazards involved with incipient stage fire fighting.

(2) The employer shall provide the education required in paragraph (g)(1) of this section upon initial employment and at least annually thereafter.

(3) The employer shall provide employees who have been designated to use fire fighting equipment as part of an emergency action plan with training in the use of the appropriate equipment.

(4) The employer shall provide the training required in paragraph (g)(3) of this section upon initial assignment to the designated group of employees and at least annually thereafter.

### **§1910.164 Fire detection systems.**

(a) *Scope and application.* This section applies to all automatic fire detection systems installed to meet the requirements of a particular OSHA standard.

(b) *Installation and restoration.* (1) The employer shall assure that all devices and equipment constructed and installed to comply with this standard are approved for the purpose for which they are intended.

(2) The employer shall restore all fire detection systems and components to normal operating condition as promptly as possible after each test or alarm. Spare detection devices and components which are normally destroyed in the process of detecting fires shall be available on the premises or from a local supplier in sufficient quantities and locations for prompt restoration of the system.

(c) *Maintenance and testing.* (1) The employer shall maintain all systems in an operable condition except during repairs or maintenance.

(2) The employer shall assure that fire detectors and fire detection systems are tested and adjusted as often as needed to maintain proper reliability and operating condition except that factory calibrated detectors need not be adjusted after installation.

(3) The employer shall assure that pneumatic and hydraulic operated detection systems installed after January 1, 1981, are equipped with supervised systems.

(4) The employer shall assure that the servicing, maintenance and testing of fire detection systems, including cleaning and necessary sensitivity adjustments are performed by a trained person knowledgeable in the operations and functions of the system.

(5) The employer shall also assure that fire detectors that need to be cleaned of dirt, dust, or other particulates in order to be fully operational are cleaned at regular periodic intervals.

(d) *Protection of fire detectors.* (1) The employer shall assure that fire detection equipment installed outdoors or in the presence of corrosive atmospheres be protected from corrosion. The employer shall provide a canopy, hood, or other suitable protection for detection equipment requiring protection from the weather.

(2) The employer shall locate or otherwise protect detection equipment so that it is protected from mechanical or physical impact which might render it inoperable.

(3) The employer shall assure that detectors are supported independently of their attachment to wires or tubing.

(e) *Response time.* (1) The employer shall assure that fire detection systems installed for the purpose of actuating fire extinguishment or suppression systems shall be designed to operate in time to control or extinguish a fire.

(2) The employer shall assure that fire detection systems installed for the purpose of employee alarm and evacuation be designed and installed to provide a warning for emergency action and safe escape of employees.

(3) The employer shall not delay alarms or devices initiated by fire detector actuation for more than 30 seconds unless such delay is necessary for the immediate safety of employees. When such delay is necessary, it shall be addressed in an emergency action plan meeting the requirements of §1910.38.

(f) *Number, location and spacing of detecting devices.* The employer shall assure that the number, spacing and location of fire detectors is based upon design data obtained from field experience, or tests, engineering surveys, the manufacturer's recommendations, or a recognized testing laboratory listing.

## §1926.150 Fire protection

(a) *General requirements.* (1) The employer shall be responsible for the development of a fire protection program to be followed throughout all phases of the construction and demolition work, and he shall provide for the firefighting equipment as specified in this subpart. As fire hazards occur, there shall be no delay in providing the necessary equipment.

(2) Access to all available firefighting equipment shall be maintained at all times.

(3) All firefighting equipment, provided by the employer, shall be conspicuously located.

(4) All firefighting equipment shall be periodically inspected and maintained in operating condition. Defective equipment shall be immediately replaced.

(5) As warranted by the project, the employer shall provide a trained and equipped firefighting organization (Fire Brigade) to assure adequate protection to life.

(b) *Water supply.* (1) A temporary or permanent water supply, of sufficient volume, duration, and pressure, required to properly operate the firefighting equipment shall be made available as soon as combustible materials accumulate.

(2) Where underground water mains are to be provided, they shall be installed, completed, and made available for use as soon as practicable.

(c) *Portable firefighting equipment -- (1) Fire extinguishers and small hose lines.* (i) A fire extinguisher, rated not less than 2A, shall be provided for each 3,000 square feet of the protected building area, or major fraction thereof. Travel distance from any point of the protected area to the nearest fire extinguisher shall not exceed 100 feet.

(ii) One 55-gallon open drum of water with two fire pails may be substituted for a fire extinguisher having a 2A rating.

(iii) A 1/2-inch diameter garden-type hose line, not to exceed 100 feet in length and equipped with a nozzle, may be substituted for a 2A-rated fire extinguisher, providing it is capable of discharging a minimum of 5 gallons per minute with a minimum hose stream range of 30 feet horizontally. The garden-type hose lines shall be mounted on conventional racks or reels. The number and location of hose racks or reels shall be such that at least one hose stream can be applied to all points in the area.

(iv) One or more fire extinguishers, rated not less than 2A, shall be provided on each floor. In multistory buildings, at least one fire extinguisher shall be located adjacent to stairway.

(v) Extinguishers and water drums, subject to freezing, shall be protected from freezing.

(vi) A fire extinguisher, rated not less than 10B, shall be provided within 50 feet of wherever more than 5 gallons of flammable or combustible liquids or 5 pounds of flammable gas are being used on the jobsite. This requirement does not apply to the integral fuel tanks of motor vehicles.

(vii) Carbon tetrachloride and other toxic vaporizing liquid fire extinguishers are prohibited.

(viii) Portable fire extinguishers shall be inspected periodically and maintained in accordance with Maintenance and Use of Portable Fire Extinguishers, NFPA No. 10A-1970.

(ix) Fire extinguishers which have been listed or approved by a nationally recognized testing laboratory, shall be used to meet the requirements of this subpart.

(x) Table F-1 may be used as a guide for selecting the appropriate portable fire extinguishers.

Table F-1 FIRE EXTINGUISHERS DATA

|  | WATER TYPE                  |                              |                                 |                               |                          | FOAM                        | CARBON DIOXIDE               | DRY CHEMICAL                    |                               |                          |                             |                              |                                 |                               |
|---|-----------------------------|------------------------------|---------------------------------|-------------------------------|--------------------------|-----------------------------|------------------------------|---------------------------------|-------------------------------|--------------------------|-----------------------------|------------------------------|---------------------------------|-------------------------------|
|   | CLASS A<br>FLAMMABLE SOLIDS | CLASS B<br>FLAMMABLE LIQUIDS | CLASS C<br>ELECTRICAL EQUIPMENT | CLASS D<br>COMBUSTIBLE METALS | CLASS K<br>KITCHEN HOODS | CLASS A<br>FLAMMABLE SOLIDS | CLASS B<br>FLAMMABLE LIQUIDS | CLASS C<br>ELECTRICAL EQUIPMENT | CLASS D<br>COMBUSTIBLE METALS | CLASS K<br>KITCHEN HOODS | CLASS A<br>FLAMMABLE SOLIDS | CLASS B<br>FLAMMABLE LIQUIDS | CLASS C<br>ELECTRICAL EQUIPMENT | CLASS D<br>COMBUSTIBLE METALS |
|  | YES                         | YES                          | YES                             | YES                           | YES                      | NO                          | NO                           | NO                              | YES                           | YES                      | YES                         | YES                          | YES                             | YES                           |
|  | NO                          | NO                           | NO                              | NO                            | YES                      | YES                         | YES                          | YES                             | YES                           | YES                      | YES                         | YES                          | YES                             | YES                           |
|  | NO                          | NO                           | NO                              | NO                            | NO                       | YES                         | YES                          | YES                             | YES                           | YES                      | YES                         | YES                          | YES                             | YES                           |
| SPECIAL EXTINGUISHING AGENTS APPROVED BY RECOGNIZED TESTING LABORATORIES            |                             |                              |                                 |                               |                          |                             |                              |                                 |                               |                          |                             |                              |                                 |                               |
| <b>AGENCY OF OPERATION</b>  | FULL (UL)                   | FULL (UL)                    | FULL (UL)                       | FULL (UL)                     | FULL (UL)                | FULL (UL)                   | FULL (UL)                    | FULL (UL)                       | FULL (UL)                     | FULL (UL)                | FULL (UL)                   | FULL (UL)                    | FULL (UL)                       | FULL (UL)                     |
| <b>RANGE</b>  | 30' - 60'                   | 30' - 60'                    | 30' - 60'                       | 30' - 60'                     | 30' - 60'                | 30' - 60'                   | 30' - 60'                    | 30' - 60'                       | 30' - 60'                     | 30' - 60'                | 30' - 60'                   | 30' - 60'                    | 30' - 60'                       | 30' - 60'                     |
| <b>MAINTENANCE</b>  | CHECK AND RECHARGE MONTHLY  | RECHARGE MONTHLY             | RECHARGE MONTHLY                | RECHARGE MONTHLY              | RECHARGE MONTHLY         | RECHARGE MONTHLY            | RECHARGE MONTHLY             | RECHARGE MONTHLY                | RECHARGE MONTHLY              | RECHARGE MONTHLY         | RECHARGE MONTHLY            | RECHARGE MONTHLY             | RECHARGE MONTHLY                | RECHARGE MONTHLY              |

(2) *Fire hose and connections.* (i) One hundred feet, or less, of 1 1/2-inch hose, with a nozzle capable of discharging water at 25 gallons or more per minute, may be substituted for a fire extinguisher rated not more than 2A in the designated area provided that the hose line can reach all points in the area.

(ii) If fire hose connections are not compatible with local firefighting equipment, the contractor shall provide adapters, or equivalent, to permit connections.

(iii) During demolition involving combustible materials, charged hose lines, supplied by hydrants, water tank trucks with pumps, or equivalent, shall be made available.

(d) *Fixed firefighting equipment -- (1) Sprinkler protection.* (i) If the facility being constructed includes the installation of automatic sprinkler protection, the installation shall closely follow the construction and be placed in service as soon as applicable laws permit following completion of each story.

(ii) During demolition or alterations, existing automatic sprinkler installations shall be retained in service as long as reasonable. The operation of sprinkler control valves shall be permitted only by properly authorized persons. Modification of sprinkler systems to permit alterations or additional demolition should be expedited so that the automatic protection may be returned to service as quickly as possible. Sprinkler control valves shall be checked daily at close of work to ascertain that the protection is in service.

(2) *Standpipes.* In all structures in which standpipes are required, or where standpipes exist in structures being altered, they shall be brought up as soon as applicable laws permit, and shall be maintained as construction progresses in such a manner that they are always ready for fire protection use. The standpipes shall be provided with Siamese fire department connections on the outside of the structure, at the street level, which shall be conspicuously marked. There shall be at least one standard hose outlet at each floor.

(e) *Fire alarm devices.* (1) An alarm system, e.g., telephone system, siren, etc., shall be established by the employer whereby employees on the site and the local fire department can be alerted for an emergency.

(2) The alarm code and reporting instructions shall be conspicuously posted at phones and at employee entrances.

(f) *Fire cutoffs.* (1) Fire walls and exit stairways, required for the completed buildings, shall be given construction priority. Fire doors, with automatic closing devices, shall be hung on openings as soon as practicable.

(2) Fire cutoffs shall be retained in buildings undergoing alterations or demolition until operations necessitate their removal.

## **§1910.39 Fire prevention plans**

(a) *Application.* An employer must have a fire prevention plan when an OSHA standard in this part requires one. The requirements in this section apply to each such fire prevention plan.

(b) *Written and oral fire prevention plans.* A fire prevention plan must be in writing, be kept in the workplace, and be made available to employees for review. However, an employer with 10 or fewer employees may communicate the plan orally to employees.

(c) *Minimum elements of a fire prevention plan.* A fire prevention plan must include:

(1) A list of all major fire hazards, proper handling and storage procedures for hazardous materials, potential ignition sources and their control, and the type of fire protection equipment necessary to control each major hazard;

(2) Procedures to control accumulations of flammable and combustible waste materials;

(3) Procedures for regular maintenance of safeguards installed on heat-producing equipment to prevent the accidental ignition of combustible materials;

(4) The name or job title of employees responsible for maintaining equipment to prevent or control sources of ignition or fires; and

(5) The name or job title of employees responsible for the control of fuel source hazards.

(d) *Employee information.* An employer must inform employees upon initial assignment to a job of the fire hazards to which they are exposed. An employer must also review with each employee those parts of the fire prevention plan necessary for self-protection.

### **1910.160 Fixed extinguishing systems, general.**

(a) *Scope and application.* (1) This section applies to all fixed extinguishing systems installed to meet a particular OSHA standard except for automatic sprinkler systems which are covered by §1910.159.

(2) This section also applies to fixed systems not installed to meet a particular OSHA standard, but which, by means of their operation, may expose employees to possible injury, death, or adverse health consequences caused by the extinguishing agent. Such systems are only subject to the requirements of paragraphs (b)(4) through (b)(7) and (c) of this section.

(3) Systems otherwise covered in paragraph (a)(2) of this section which are installed in areas with no employee exposure are exempted from the requirements of this section.

(b) *General requirements.* (1) Fixed extinguishing system components and agents shall be designed and approved for use on the specific fire hazards they are expected to control or extinguish.

(2) If for any reason a fixed extinguishing system becomes inoperable, the employer shall notify employees and take the necessary temporary precautions to assure their safety until the system is restored to operating order. Any defects or impairments shall be properly corrected by trained personnel.

(3) The employer shall provide a distinctive alarm or signaling system which complies with §1910.165 and is capable of being perceived above ambient noise or light levels, on all extinguishing systems in those portions of the workplace covered by the extinguishing

system to indicate when the extinguishing system is discharging. Discharge alarms are not required on systems where discharge is immediately recognizable.

(4) The employer shall provide effective safeguards to warn employees against entry into discharge areas where the atmosphere remains hazardous to employee safety or health.

(5) The employer shall post hazard warning or caution signs at the entrance to, and inside of, areas protected by fixed extinguishing systems which use agents in concentrations known to be hazardous to employee safety and health.

(6) The employer shall assure that fixed systems are inspected annually by a person knowledgeable in the design and function of the system to assure that the system is maintained in good operating condition.

(7) The employer shall assure that the weight and pressure of refillable containers is checked at least semi-annually. If the container shows a loss in net content or weight of more than 5 percent, or a loss in pressure of more than 10 percent, it shall be subjected to maintenance.

(8) The employer shall assure that factory charged nonrefillable containers which have no means of pressure indication are weighed at least semi-annually. If a container shows a loss in net weight or more than 5 percent it shall be replaced.

(9) The employer shall assure that inspection and maintenance dates are recorded on the container, on a tag attached to the container, or in a central location. A record of the last semi-annual check shall be maintained until the container is checked again or for the life of the container, whichever is less.

(10) The employer shall train employees designated to inspect, maintain, operate, or repair fixed extinguishing systems and annually review their training to keep them up-to-date in the functions they are to perform.

(11) The employer shall not use chlorobromomethane or carbon tetrachloride as an extinguishing agent where employees may be exposed.

(12) The employer shall assure that systems installed in the presence of corrosive atmospheres are constructed of non-corrosive material or otherwise protected against corrosion.

(13) Automatic detection equipment shall be approved, installed and maintained in accordance with §1910.164.

(14) The employer shall assure that all systems designed for and installed in areas with climatic extremes shall operate effectively at the expected extreme temperatures.

(15) The employer shall assure that at least one manual station is provided for discharge activation of each fixed extinguishing system.

(16) The employer shall assure that manual operating devices are identified as to the hazard against which they will provide protection.

(17) The employer shall provide and assure the use of the personal protective equipment needed for immediate rescue of employees trapped in hazardous atmospheres created by an agent discharge.

(c) *Total flooding systems with potential health and safety hazards to employees.* (1) The employer shall provide an emergency action plan in accordance with §1910.38 for each area within a workplace that is protected by a total flooding system which provides agent concentrations exceeding the maximum safe levels set forth in paragraphs (b)(5) and (b)(6) of §1910.162.

(2) Systems installed in areas where employees cannot enter during or after the system's operation are exempt from the requirements of paragraph (c) of this section.

(3) On all total flooding systems the employer shall provide a pre-discharge employee alarm which complies with §1910.165, and is capable of being perceived above ambient light or noise levels before the system discharges, which will give employees time to safely exit from the discharge area prior to system discharge.

(4) The employer shall provide automatic actuation of total flooding systems by means of an approved fire detection device installed and interconnected with a pre-discharge employee alarm system to give employees time to safely exit from the discharge area prior to system discharge.

## **§1926.151 Fire prevention**

(a) *Ignition hazards.* (1) Electrical wiring and equipment for light, heat, or power purposes shall be installed in compliance with the requirements of subpart K of this part.

(2) Internal combustion engine powered equipment shall be so located that the exhausts are well away from combustible materials. When the exhausts are piped to outside the building under construction, a clearance of at least 6 inches shall be maintained between such piping and combustible material.

(3) Smoking shall be prohibited at or in the vicinity of operations which constitute a fire hazard, and shall be conspicuously posted: "No Smoking or Open Flame."

(4) Portable battery powered lighting equipment, used in connection with the storage, handling, or use of flammable gases or liquids, shall be of the type approved for the hazardous locations.



(5) The nozzle of air, inert gas, and steam lines or hoses, when used in the cleaning or ventilation of tanks and vessels that contain hazardous concentrations of flammable gases or vapors, shall be bonded to the tank or vessel shell. Bonding devices shall not be attached or detached in hazardous concentrations of flammable gases or vapors.

(b) *Temporary buildings.* (1) No temporary building shall be erected where it will adversely affect any means of exit.

(2) Temporary buildings, when located within another building or structure, shall be of either noncombustible construction or of combustible construction having a fire resistance of not less than 1 hour.

(3) Temporary buildings, located other than inside another building and not used for the storage, handling, or use of flammable or combustible liquids, flammable gases, explosives, or blasting agents, or similar hazardous occupancies, shall be located at a distance of not less than 10 feet from another building or structure. Groups of temporary buildings, not exceeding 2,000 square feet in aggregate, shall, for the purposes of this part, be considered a single temporary building.

(c) *Open yard storage.* (1) Combustible materials shall be piled with due regard to the stability of piles and in no case higher than 20 feet.

(2) Driveways between and around combustible storage piles shall be at least 15 feet wide and maintained free from accumulation of rubbish, equipment, or other articles or materials. Driveways shall be so spaced that a maximum grid system unit of 50 feet by 150 feet is produced.

(3) The entire storage site shall be kept free from accumulation of unnecessary combustible materials. Weeds and grass shall be kept down and a regular procedure provided for the periodic cleanup of the entire area.

(4) When there is a danger of an underground fire, that land shall not be used for combustible or flammable storage.

(5) Method of piling shall be solid wherever possible and in orderly and regular piles. No combustible material shall be stored outdoors within 10 feet of a building or structure.

(6) Portable fire extinguishing equipment, suitable for the fire hazard involved, shall be provided at convenient, conspicuously accessible locations in the yard area. Portable fire extinguishers, rated not less than 2A, shall be placed so that maximum travel distance to the nearest unit shall not exceed 100 feet.

(d) *Indoor storage.* (1) Storage shall not obstruct, or adversely affect, means of exit.

(2) All materials shall be stored, handled, and piled with due regard to their fire characteristics.

(3) Noncompatible materials, which may create a fire hazard, shall be segregated by a barrier having a fire resistance of at least 1 hour.

(4) Material shall be piled to minimize the spread of fire internally and to permit convenient access for firefighting. Stable piling shall be maintained at all times. Aisle space shall be maintained to safely accommodate the widest vehicle that may be used within the building for firefighting purposes.

(5) Clearance of at least 36 inches shall be maintained between the top level of the stored material and the sprinkler deflectors.

(6) Clearance shall be maintained around lights and heating units to prevent ignition of combustible materials.

(7) A clearance of 24 inches shall be maintained around the path of travel of fire doors unless a barricade is provided, in which case no clearance is needed. Material shall not be stored within 36 inches of a fire door opening.

### **§1910.36 Design and construction requirements for exit routes**

(a) *Basic requirements.* Exit routes must meet the following design and construction requirements:

(1) *An exit route must be permanent.* Each exit route must be a permanent part of the workplace.

(2) *An exit must be separated by fire resistant materials.* Construction materials used to separate an exit from other parts of the workplace must have a one-hour fire resistance-rating if the exit connects three or fewer stories and a two-hour fire resistance-rating if the exit connects four or more stories.

(3) *Openings into an exit must be limited.* An exit is permitted to have only those openings necessary to allow access to the exit from occupied areas of the workplace, or to the exit discharge. An opening into an exit must be protected by a self-closing fire door that remains closed or automatically closes in an emergency upon the sounding of a fire alarm or employee alarm system. Each fire door, including its frame and hardware, must be listed or approved by a nationally recognized testing laboratory. Section 1910.155(c)(3)(iv)(A) of this part defines "listed" and §1910.7 of this part defines a "nationally recognized testing laboratory."

(b) *The number of exit routes must be adequate -- (1) Two exit routes.* At least two exit routes must be available in a workplace to permit prompt evacuation of employees and other building occupants during an emergency, except as allowed in paragraph (b)(3) of this section. The exit routes must be located as far away as practical from each other so that if one exit route is blocked by fire or smoke, employees can evacuate using the second exit route.

(2) *More than two exit routes.* More than two exit routes must be available in a workplace if the number of employees, the size of the building, its occupancy, or the arrangement of the workplace is such that all employees would not be able to evacuate safely during an emergency.

(3) *A single exit route.* A single exit route is permitted where the number of employees, the size of the building, its occupancy, or the arrangement of the

workplace is such that all employees would be able to evacuate safely during an emergency.

**Note to paragraph 1910.36(B):** For assistance in determining the number of exit routes necessary for your workplace, consult NFPA 101-2000, Life Safety Code.

(c) *Exit discharge.* (1) Each exit discharge must lead directly outside or to a street, walkway, refuge area, public way, or open space with access to the outside.

(2) The street, walkway, refuge area, public way, or open space to which an exit discharge leads must be large enough to accommodate the building occupants likely to use the exit route.

(3) Exit stairs that continue beyond the level on which the exit discharge is located must be interrupted at that level by doors, partitions, or other effective means that clearly indicate the direction of travel leading to the exit discharge.

(d) *An exit door must be unlocked.* (1) Employees must be able to open an exit route door from the inside at all times without keys, tools, or special knowledge. A device such as a panic bar that locks only from the outside is permitted on exit discharge doors.

(2) Exit route doors must be free of any device or alarm that could restrict emergency use of the exit route if the device or alarm fails.

(3) An exit route door may be locked from the inside only in mental, penal, or correctional facilities and then only if supervisory personnel are continuously on duty and the employer has a plan to remove occupants from the facility during an emergency.

(e) *A side-hinged exit door must be used.* (1) A side-hinged door must be used to connect any room to an exit route.

(2) The door that connects any room to an exit route must swing out in the direction of exit travel if the room is designed to be occupied by more than 50 people or if the room is a high hazard area (*i.e.*, contains contents that are likely to burn with extreme rapidity or explode).

(f) *The capacity of an exit route must be adequate.* (1) Exit routes must support the maximum permitted occupant load for each floor served.

(2) The capacity of an exit route may not decrease in the direction of exit route travel to the exit discharge.

**Note to paragraph 1910.36(F):** Information regarding "Occupant load" is located in NFPA 101-2000, Life Safety Code.

(g) *An exit route must meet minimum height and width requirements.* (1) The ceiling of an exit route must be at least seven feet six inches (2.3 m) high. Any projection from the ceiling must not reach a point less than six feet eight inches (2.0 m) from the floor.

(2) An exit access must be at least 28 inches (71.1 cm) wide at all points. Where there is only one exit access leading to an exit or exit discharge, the width of the exit and exit discharge must be at least equal to the width of the exit access.

(3) The width of an exit route must be sufficient to accommodate the maximum permitted occupant load of each floor served by the exit route.

(4) Objects that project into the exit route must not reduce the width of the exit route to less than the minimum width requirements for exit routes.

(h) *An outdoor exit route is permitted.* Each outdoor exit route must meet the minimum height and width requirements for indoor exit routes and must also meet the following requirements:

(1) The outdoor exit route must have guardrails to protect unenclosed sides if a fall hazard exists;

(2) The outdoor exit route must be covered if snow or ice is likely to accumulate along the route, unless the employer can demonstrate that any snow or ice accumulation will be removed before it presents a slipping hazard;

(3) The outdoor exit route must be reasonably straight and have smooth, solid, substantially level walkways; and

(4) The outdoor exit route must not have a dead-end that is longer than 20 feet (6.2 m).

## **§1910.37 Maintenance, safeguards, and operational features for exit routes**

(a) *The danger to employees must be minimized.* (1) Exit routes must be kept free of explosive or highly flammable furnishings or other decorations.

(2) Exit routes must be arranged so that employees will not have to travel toward a high hazard area, unless the path of travel is effectively shielded from the high hazard area by suitable partitions or other physical barriers.

(3) Exit routes must be free and unobstructed. No materials or equipment may be placed, either permanently or temporarily, within the exit route. The exit access must not go through a room that can be locked, such as a bathroom, to reach an exit or exit discharge, nor may it lead into a dead-end corridor. Stairs or a ramp must be provided where the exit route is not substantially level.

(4) Safeguards designed to protect employees during an emergency (*e.g.*, sprinkler systems, alarm systems, fire doors, exit lighting) must be in proper working order at all times.

(b) *Lighting and marking must be adequate and appropriate.* (1) Each exit route must be adequately lighted so that an employee with normal vision can see along the exit route.

(2) Each exit must be clearly visible and marked by a sign reading "Exit."



(3) Each exit route door must be free of decorations or signs that obscure the visibility of the exit route door.



(4) If the direction of travel to the exit or exit discharge is not immediately apparent, signs must be posted along the exit access indicating the direction of travel to the nearest exit and exit discharge. Additionally, the line-of-sight to an exit sign must clearly be visible at all times.



(5) Each doorway or passage along an exit access that could be mistaken for an exit must be marked "Not an Exit" or similar designation, or be identified by a sign indicating its actual use (e.g., closet).



(6) Each exit sign must be illuminated to a surface value of at least five foot-candles (54 lux) by a reliable light source and be distinctive in color. Self-luminous or electroluminescent signs that have a minimum luminance surface value of at least .06 footlamberts (0.21 cd/m<sup>2</sup>) are permitted.



(7) Each exit sign must have the word "Exit" in plainly legible letters not less than six inches (15.2 cm) high, with the principal strokes of the letters in the word "Exit" not less than three-fourths of an inch (1.9 cm) wide.

(c) *The fire retardant properties of paints or solutions must be maintained.* Fire retardant paints or solutions must be renewed as often as necessary to maintain their fire retardant properties.

(d) *Exit routes must be maintained during construction, repairs, or alterations.* (1) During new construction, employees must not occupy a workplace until the exit routes required by this subpart are completed and ready for employee use for the portion of the workplace they occupy.

(2) During repairs or alterations, employees must not occupy a workplace unless the exit routes required by this subpart are available and existing fire protections are maintained, or until alternate fire protection is furnished that provides an equivalent level of safety.

(3) Employees must not be exposed to hazards of flammable or explosive substances or equipment used during construction, repairs, or alterations, that are beyond the normal permissible conditions in the workplace, or that would impede exiting the workplace.

(e) *An employee alarm system must be operable.* Employers must install and maintain an operable employee alarm system that has a distinctive signal to warn employees of fire or other emergencies, unless employees can promptly see or smell a fire or other hazard in time to provide adequate warning to them. The employee alarm system must comply with §1910.165.

### **§1910.165 Employee alarm systems**

(a) *Scope and application.* (1) This section applies to all emergency employee alarms installed to meet a particular OSHA standard. This section does not apply to those discharge or supervisory alarms required on various fixed extinguishing systems or to supervisory alarms on fire suppression, alarm or detection systems unless they are intended to be employee alarm systems.

(2) The requirements in this section that pertain to maintenance, testing and inspection shall apply to all local fire alarm signaling systems used for alerting employees regardless of the other functions of the system.

(3) All pre-discharge employee alarms installed to meet a particular OSHA standard shall meet the requirements of paragraphs (b)(1) through (4), (c), and (d)(1) of this section.

(b) *General requirements.* (1) The employee alarm system shall provide warning for necessary emergency action as called for in the emergency action plan, or for reaction time for safe escape of employees from the workplace or the immediate work area, or both.

(2) The employee alarm shall be capable of being perceived above ambient noise or light levels by all employees in the affected portions of the workplace. Tactile devices may be used to alert those employees who would not otherwise be able to recognize the audible or visual alarm.

(3) The employee alarm shall be distinctive and recognizable as a signal to evacuate the work area or to perform actions designated under the emergency action plan.

(4) The employer shall explain to each employee the preferred means of reporting emergencies, such as manual pull box alarms, public address systems, radio or telephones. The employer shall post emergency telephone numbers near telephones, or employee notice boards, and other conspicuous locations when telephones serve as a means of reporting emergencies. Where a communication system also serves as the employee alarm system, all emergency messages shall have priority over all non-emergency messages.

(5) The employer shall establish procedures for sounding emergency alarms in the workplace. For those employers with 10 or fewer employees in a particular workplace, direct voice communication is an acceptable procedure for sounding the alarm provided all employees can hear the alarm. Such workplaces need not have a back-up system.

(c) *Installation and restoration.* (1) The employer shall assure that all devices, components, combinations of devices or systems constructed and installed to comply with this standard are approved. Steam whistles, air horns, strobe lights or similar lighting devices, or tactile devices meeting the requirements of this section are considered to meet this requirement for approval.

(2) The employer shall assure that all employee alarm systems are restored to normal operating condition as promptly as possible after each test or alarm. Spare alarm devices and components subject to wear or destruction shall be available in sufficient quantities and locations for prompt restoration of the system.

(d) *Maintenance and testing.* (1) The employer shall assure that all employee alarm systems are maintained in operating condition except when undergoing repairs or maintenance.

(2) The employer shall assure that a test of the reliability and adequacy of non-supervised employee alarm systems is made every two months. A different actuation device shall be used in each test of a multi-actuation device system so that no individual device is used for two consecutive tests.

(3) The employer shall maintain or replace power supplies as often as is necessary to assure a fully operational condition. Back-up means of alarm, such as employee runners or telephones, shall be provided when systems are out of service.

(4) The employer shall assure that employee alarm circuitry installed after January 1, 1981, which is capable of being supervised is supervised and that it will provide positive notification to assigned personnel whenever a deficiency exists in the system. The employer shall assure that all supervised employee alarm systems are tested at least annually for reliability and adequacy.

(5) The employer shall assure that the servicing, maintenance and testing of employee alarms are done by persons trained in the designed operation and functions necessary for reliable and safe operation of the system.

(e) *Manual operation.* The employer shall assure that manually operated actuation devices for use in conjunction with employee alarms are unobstructed, conspicuous and readily accessible.

## **§1910.151 Medical services and first aid**

(a) The employer shall ensure the ready availability of medical personnel for advice and consultation on matters of plant health.

(b) In the absence of an infirmary, clinic, or hospital in near proximity to the workplace which is used for the treatment of all injured employees, a person or persons shall be adequately trained to render first aid. Adequate first aid supplies shall be readily available.

(c) Where the eyes or body of any person may be exposed to injurious corrosive materials, suitable facilities for quick drenching or flushing of the eyes and body shall be provided within the work area for immediate emergency use.

### **APPENDIX A TO §1910.151 -- FIRST AID KITS (NON-MANDATORY)**

First aid supplies are required to be readily available under paragraph §1910.151(b). An example of the minimal contents of a generic first aid kit is described in American National Standard (ANSI) Z308.1-1978 "Minimum Requirements for Industrial Unit-Type First-aid Kits." The contents of the kit listed in the ANSI standard should be adequate for small worksites. When larger operations or multiple operations are being conducted at the same location, employers should determine the need for additional first aid kits at the worksite, additional types of first aid equipment and supplies and additional quantities and types of supplies and equipment in the first aid kits.

In a similar fashion, employers who have unique or changing first-aid needs in their workplace may need to enhance their first-aid kits. The employer can use the OSHA 200 log, OSHA 101's or other reports to identify these unique problems. Consultation from the local fire/rescue department, appropriate medical professional, or local emergency room may be helpful to employers in these circumstances. By assessing the specific needs of their workplace, employers can ensure that reasonably anticipated supplies are available. Employers should assess the specific needs of their worksite periodically and augment the first aid kit appropriately.

If it is reasonably anticipated that employees will be exposed to blood or other potentially infectious materials while using first aid supplies, employers are required to provide appropriate personal protective equipment (PPE) in compliance with the provisions of the Occupational Exposure to Blood borne Pathogens standard, §1910.1030(d)(3) (56 FR



64175). This standard lists appropriate PPE for this type of exposure, such as gloves, gowns, face shields, masks, and eye protection.

## **§1926.50 Medical services and first aid**

- (a) The employer shall insure the availability of medical personnel for advice and consultation on matters of occupational health.
- (b) Provisions shall be made prior to commencement of the project for prompt medical attention in case of serious injury.
- (c) In the absence of an infirmary, clinic, hospital, or physician, that is reasonably accessible in terms of time and distance to the worksite, which is available for the treatment of injured employees, a person who has a valid certificate in first-aid training from the U.S. Bureau of Mines, the American Red Cross, or equivalent training that can be verified by documentary evidence, shall be available at the worksite to render first aid.
- (d)(1) First aid supplies shall be easily accessible when required.
  - (2) The contents of the first aid kit shall be placed in a weatherproof container with individual sealed packages for each type of item, and shall be checked by the employer before being sent out on each job and at least weekly on each job to ensure that the expended items are replaced.
- (e) Proper equipment for prompt transportation of the injured person to a physician or hospital, or a communication system for contacting necessary ambulance service, shall be provided.
- (f) In areas where 911 is not available, the telephone numbers of the physicians, hospitals, or ambulances shall be conspicuously posted.
- (g) Where the eyes or body of any person may be exposed to injurious corrosive materials, suitable facilities for quick drenching or flushing of the eyes and body shall be provided within the work area for immediate emergency use.

### **APPENDIX A TO §1926.50 -- FIRST AID KITS (NON-MANDATORY)**

First aid supplies are required to be easily accessible under paragraph §1926.50(d)(1). An example of the minimal contents of a generic first aid kit is described in American National Standard (ANSI) Z308.1-1978 "Minimum Requirements for Industrial Unit-Type First-aid Kits". The contents of the kit listed in the ANSI standard should be adequate for small work sites. When larger operations or multiple operations are being conducted at the same location, employers should determine the need for additional first aid kits at the worksite, additional types of first aid equipment and supplies and additional quantities and types of supplies and equipment in the first aid kits.

In a similar fashion, employers who have unique or changing first-aid needs in their workplace, may need to enhance their first-aid kits. The employer can use the OSHA 200 log, OSHA 101's or other reports to identify these unique problems. Consultation from the local Fire/Rescue Department, appropriate medical professional, or local emergency room may be helpful to employers in these circumstances. By assessing the specific needs of their workplace, employers can ensure that reasonably anticipated supplies are available. Employers should assess the specific needs of their worksite periodically and augment the first aid kit appropriately.

If it is reasonably anticipated employees will be exposed to blood or other potentially infectious materials while using first-aid supplies, employers should provide personal protective equipment (PPE). Appropriate PPE includes gloves, gowns, face shields, masks and eye protection (see "Occupational Exposure to Blood borne Pathogens", 29 CFR 1910.1030(d)(3)) (56 FR 64175).

## [Requirements/Definitions/Q&A provided in OSHA website](#)

### **Introduction**

Nobody expects an emergency or disaster -- especially one that affects them, their employees, and their business personally. Yet the simple truth is that emergencies and disasters can strike anyone, anytime, and anywhere. You and your employees could be forced to evacuate your company when you least expect it.

This booklet is designed to help you, the employer, plan for that possibility. The best way to protect yourself, your workers, and your business is to expect the unexpected and develop a well-thought out emergency action plan to guide you when immediate action is necessary.

### **What is a workplace emergency?**

A workplace emergency is an unforeseen situation that threatens your employees, customers, or the public; disrupts or shuts down your operations; or causes physical or environmental damage. Emergencies may be natural or manmade and include the following:

- Floods,
- Hurricanes,
- Tornadoes,
- Fires,
- Toxic gas releases,
- Chemical spills,
- Radiological accidents,
- Explosions,
- Civil disturbances, and
- Workplace violence resulting in bodily harm and trauma.

## **How do you protect yourself, your employees, and your business?**

The best way is to prepare to respond to an emergency before it happens. Few people can think clearly and logically in a crisis, so it is important to do so in advance, when you have time to be thorough.

**Brainstorm the worst-case scenarios.** Ask yourself what you would do if the worst happened. What if a fire broke out in your boiler room? Or a hurricane hit your building head-on? Or a train carrying hazardous waste derailed while passing your loading dock? Once you have identified potential emergencies, consider how they would affect you and your workers and how you would respond.

## **What is an emergency action plan?**

An emergency action plan covers designated actions employers and employees must take to ensure employee safety from fire and other emergencies. Not all employers are required to establish an emergency action plan. See the flowchart on page 11 to determine if you are. Even if you are not specifically required to do so, compiling an emergency action plan is a good way to protect yourself, your employees, and your business during an emergency.

Putting together a comprehensive emergency action plan that deals with all types of issues specific to your worksite is not difficult.

You may find it beneficial to include your management team and employees in the process. Explain your goal of protecting lives and property in the event of an emergency, and ask for their help in establishing and implementing your emergency action plan. Their commitment and support are critical to the plan's success.

## **What should your emergency action plan include?**

When developing your emergency action plan, it's a good idea to look at a wide variety of potential emergencies that could occur in your workplace. It should be tailored to your worksite and include information about all potential sources of emergencies. Developing an emergency action plan means you should do a hazard assessment to determine what, if any, physical or chemical hazards in your workplaces could cause an emergency. If you have more than one worksite, each site should have an emergency action plan.

## **At a minimum, your emergency action plan must include the following:**

- A preferred method for reporting fires and other emergencies;
- An evacuation policy and procedure;
- Emergency escape procedures and route assignments, such as floor plans, workplace maps, and safe or refuge areas;
- Names, titles, departments, and telephone numbers of individuals both within and outside your company to contact for additional information or explanation of duties and responsibilities under the emergency plan;
- Procedures for employees who remain to perform or shut down critical plant operations, operate fire extinguishers, or perform other essential services that cannot be shut down for every emergency alarm before evacuating; and
- Rescue and medical duties for any workers designated to perform them.

You also may want to consider designating an assembly location and procedures to account for all employees after an evacuation.

**In addition, although they are not specifically required by OSHA, you may find it helpful to include in your plan the following:**

- The site of an alternative communications center to be used in the event of a fire or explosion; and
- A secure on- or offsite location to store originals or duplicate copies of accounting records, legal documents, your employees' emergency contact lists, and other essential records.

### **How do you alert employees to an emergency?**

Your plan must include a way to alert employees, including disabled workers, to evacuate or take other action, and how to report emergencies, as required. Among the steps you must take are the following:

- Make sure alarms are distinctive and recognized by all employees as a signal to evacuate the work area or perform actions identified in your plan;
- Make available an emergency communications system such as a public address system, portable radio unit, or other means to notify employees of the emergency and to contact local law enforcement, the fire department, and others; and
- Stipulate that alarms must be able to be heard, seen, or otherwise perceived by everyone in the workplace. You might want to consider providing an auxiliary power supply in the event that electricity is shut off. (29 CFR 1910.165(b)(2) offers more information on alarms.)

Although it is not specifically required by OSHA, you also may want to consider the following:

- Using tactile devices to alert employees who would not otherwise be able to recognize an audible or visual alarm; and
- Providing an updated list of key personnel such as the plant manager or physician, in order of priority, to notify in the event of an emergency during off-duty hours.

### **How do you develop an evacuation policy and procedures?**

A disorganized evacuation can result in confusion, injury, and property damage. That is why when developing your emergency action plan it is important to determine the following:

- Conditions under which an evacuation would be necessary;
- A clear chain of command and designation of the person in your business authorized to order an evacuation or shutdown. You may want to designate an "evacuation warden" to assist others in an evacuation and to account for personnel;
- Specific evacuation procedures, including routes and exits. Post these procedures where they are easily accessible to all employees;
- Procedures for assisting people with disabilities or who do not speak English;
- Designation of what, if any, employees will continue or shut down critical operations during an evacuation. These people must be capable of recognizing when to abandon the operation and evacuate themselves; and
- A system for accounting for personnel following an evacuation. Consider employees' transportation needs for community-wide evacuations.

## **Under what conditions should you call for an evacuation?**

In the event of an emergency, local emergency officials may order you to evacuate your premises. In some cases, they may instruct you to shut off the water, gas, and electricity. If you have access to radio or television, listen to newscasts to keep informed and follow whatever official orders you receive.

In other cases, a designated person within your business should be responsible for making the decision to evacuate or shut down operations. Protecting the health and safety of everyone in the facility should be the first priority. In the event of a fire, an immediate evacuation to a predetermined area away from the facility is the best way to protect employees. On the other hand, evacuating employees may not be the best response to an emergency such as a toxic gas release at a facility across town from your business.

The type of building you work in may be a factor in your decision. Most buildings are vulnerable to the effects of disasters such as tornadoes, earthquakes, floods, or explosions. The extent of the damage depends on the type of emergency and the building's construction. Modern factories and office buildings, for example, are framed in steel and are structurally more sound than neighborhood business premises may be. In a disaster such as a major earthquake or explosion, however, nearly every type of structure will be affected. Some buildings will collapse and others will be left with weakened floors and walls.

## **What is the role of coordinators and evacuation wardens during an emergency?**

When drafting your emergency action plan, you may wish to select a responsible individual to lead and coordinate your emergency plan and evacuation. It is critical that employees know who the coordinator is and understand that person has the authority to make decisions during emergencies.

### **The coordinator should be responsible for the following:**

- Assessing the situation to determine whether an emergency exists requiring activation of your emergency procedures;
- Supervising all efforts in the area, including evacuating personnel;
- Coordinating outside emergency services, such as medical aid and local fire departments, and ensuring that they are available and notified when necessary; and
- Directing the shutdown of plant operations when required.

You also may find it beneficial to coordinate the action plan with other employers when several employers share the worksite, although OSHA standards do not specifically require this.

In addition to a coordinator, you may want to designate evacuation wardens to help move employees from danger to safe areas during an emergency. Generally, one warden for every 20 employees should be adequate, and the appropriate number of wardens should be available at all times during working hours.

Employees designated to assist in emergency evacuation procedures should be trained in the complete workplace layout and various alternative escape routes. All employees and those designated to assist in emergencies should be made aware of employees with special needs who may require extra assistance, how to use the buddy system, and hazardous areas to avoid during an emergency evacuation.

### **How do you establish evacuation routes and exits?**

When preparing your emergency action plan, designate primary and secondary evacuation routes and exits. To the extent possible under the conditions, ensure that evacuation routes and emergency exits meet the following conditions:

- Clearly marked and well lit;
- Wide enough to accommodate the number of evacuating personnel;
- Unobstructed and clear of debris at all times; and
- Unlikely to expose evacuating personnel to additional hazards.

If you prepare drawings that show evacuation routes and exits, post them prominently for all employees to see.

### **How do you account for employees after an evacuation?**

Accounting for all employees following an evacuation is critical. Confusion in the assembly areas can lead to delays in rescuing anyone trapped in the building, or unnecessary and dangerous search-and-rescue operations. To ensure the fastest, most accurate accountability of your employees, you may want to consider including these steps in your emergency action plan:

- Designate assembly areas where employees should gather after evacuating;
- Take a head count after the evacuation. Identify the names and last known locations of anyone not accounted for and pass them to the official in charge;
- Establish a method for accounting for non-employees such as suppliers and customers; and
- Establish procedures for further evacuation in case the incident expands. This may consist of sending employees home by normal means or providing them with transportation to an offsite location.

### **How should you plan for rescue operations?**

It takes more than just willing hands to save lives. Untrained individuals may endanger themselves and those they are trying to rescue. For this reason, it is generally wise to leave rescue work to those who are trained, equipped, and certified to conduct rescues.

If you have operations that take place in permit-required confined spaces, you may want your emergency action plan to include rescue procedures that specifically address entry into each confined space. (See also OSHA Publication 3138, Permit-Required Confined Spaces, and the National Institute for Occupational Safety and Health (NIOSH) Publication 80-106, Criteria for a Recommended Standard...Working in Confined Spaces.)

### **What medical assistance should you provide during an emergency?**

If your company does not have a formal medical program, you may want to investigate ways to provide medical and first-aid services. If medical facilities are available near your worksite, you can make arrangements for them to handle emergency cases. Provide your employees with a written emergency medical procedure to minimize confusion during an emergency.

If an infirmary, clinic, or hospital is not close to your workplace, ensure that onsite person(s) have adequate training in first aid. The American Red Cross, some insurance providers, local safety councils, fire departments, or other resources may be able to

provide this training. Treatment of a serious injury should begin within 3 to 4 minutes of the accident.

Consult with a physician to order appropriate first-aid supplies for emergencies. Medical personnel must be accessible to provide advice and consultation in resolving health problems that occur in the workplace. Establish a relationship with a local ambulance service so transportation is readily available for emergencies.

What role should employees play in your emergency action plan?

The best emergency action plans include employees in the planning process, specify what employees should do during an emergency, and ensure that employees receive proper training for emergencies. When you include your employees in your planning, encourage them to offer suggestions about potential hazards, worst-case scenarios, and proper emergency responses. After you develop the plan, review it with your employees to make sure everyone knows what to do before, during and after an emergency.

Keep a copy of your emergency action plan in a convenient location where employees can get to it, or provide all employees a copy. If you have 10 or fewer employees, you may communicate your plan orally.

#### **What employee information should your plan include?**

In the event of an emergency, it could be important to have ready access to important personal information about your employees. This includes their home telephone numbers, the names and telephone numbers of their next of kin, and medical information.

#### **What type of training do your employees need?**

Educate your employees about the types of emergencies that may occur and train them in the proper course of action. The size of your workplace and workforce, processes used, materials handled, and the availability of onsite or outside resources will determine your training requirements. Be sure all your employees understand the function and elements of your emergency action plan, including types of potential emergencies, reporting procedures, alarm systems, evacuation plans, and shutdown procedures. Discuss any special hazards you may have onsite such as flammable materials, toxic chemicals, radioactive sources, or water-reactive substances. Clearly communicate to your employees who will be in charge during an emergency to minimize confusion.

#### **General training for your employees should address the following:**

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

You also may wish to train your employees in first-aid procedures, including protection against bloodborne pathogens; respiratory protection, including use of an escape-only respirator; and methods for preventing unauthorized access to the site.

Once you have reviewed your emergency action plan with your employees and everyone



has had the proper training, it is a good idea to hold practice drills as often as necessary to keep employees prepared. Include outside resources such as fire and police departments when possible. After each drill, gather management and employees to evaluate the effectiveness of the drill. Identify the strengths and weaknesses of your plan and work to improve it.

### **How often do you need to train your employees?**

Review your plan with all your employees and consider requiring annual training in the plan. Also offer training when you do the following:

- Develop your initial plan;
- Hire new employees;
- Introduce new equipment, materials, or processes into the workplace that affect evacuation routes;
- Change the layout or design of the facility; and
- Revise or update your emergency procedures.

### **What does your plan need to include about hazardous substances?**

No matter what kind of business you run, you could potentially face an emergency involving hazardous materials such as flammable, explosive, toxic, noxious, corrosive, biological, oxidizable, or radioactive substances.

The source of the hazardous substances could be external, such as a local chemical plant that catches on fire or an oil truck that overturns on a nearby freeway. The source may be within your physical plant. Regardless of the source, these events could have a direct impact on your employees and your business and should be addressed by your emergency action plan.

If you use or store hazardous substances at your worksite, you face an increased risk of an emergency involving hazardous materials and should address this possibility in your emergency action plan. OSHA's Hazard Communication Standard (29 CFR 1910.1200) requires employers who use hazardous chemicals to inventory them, keep the manufacturer-supplied Material Safety Data Sheets (MSDSs) for them in a place accessible to workers, label containers of these chemicals with their hazards, and train employees in ways to protect themselves against those hazards. A good way to start is to determine from your hazardous chemical inventory what hazardous chemicals you use and to gather the MSDSs for the chemicals. MSDSs describe the hazards that a chemical may present, list the precautions to take when handling, storing, or using the substance, and outline emergency and first-aid procedures.

For specific information on how to respond to emergencies involving hazardous materials and hazardous waste operations, refer to 29 CFR, Part 1910.120(q) and OSHA Publication 3114, *Hazardous Waste and Emergency Response Operations*. Both are available online at [www.osha.gov](http://www.osha.gov).

### **What special equipment should you provide for emergencies?**

Your employees may need personal protective equipment to evacuate during an emergency. Personal protective equipment must be based on the potential hazards in the workplace. Assess your workplace to determine potential hazards and the appropriate controls and protective equipment for those hazards. Personal protective equipment may include items such as the following:



- Safety glasses, goggles, or face shields for eye protection;
- Hard hats and safety shoes for head and foot protection;
- Proper respirators;
- Chemical suits, gloves, hoods, and boots for body protection from chemicals;
- Special body protection for abnormal environmental conditions such as extreme temperatures; and
- Any other special equipment or warning devices necessary for hazards unique to your worksite.

### **How do you choose appropriate respirators and other equipment?**

Consult with health and safety professionals before making any purchases. Respirators selected should be appropriate to the hazards in your workplace, meet OSHA standards criteria, and be certified by the National Institute for Occupational Safety and Health.

Respiratory protection may be necessary if your employees must pass through toxic atmospheres of dust, mists, gases, or vapors, or through oxygen-deficient areas while evacuating. There are four basic categories of respirators for use in different conditions. All respirators must be NIOSH-certified under the current 29 CFR 1910.134. See also OSHA's Small Entity Compliance Guide for Respiratory Protection, 1999, online at [www.osha.gov](http://www.osha.gov).

### **Who should you coordinate with when drafting your emergency action plan?**

Although there is no specific OSHA requirement to do so, you may find it useful to coordinate your efforts with any other companies or employee groups in your building to ensure the effectiveness of your plan. In addition, if you rely on assistance from local emergency responders such as the fire department, local HAZMAT teams, or other outside responders, you may find it useful to coordinate your emergency plans with these organizations. This ensures that you are aware of the capabilities of these outside responders and that they know what you expect of them.

### **What are OSHA's requirements for emergencies?**

Some of the key OSHA requirements for emergencies can be found in the following sections of the agency's General Industry Occupational Safety and Health Standards (29 CFR 1910).

#### **Subpart E -- Means of Egress**

1910.37 Means of egress

1910.38 Employee emergency plans and fire prevention plans

Appendix Means of egress

#### **Subpart H -- Hazardous Materials**

1910.119 Process safety management of highly hazardous chemicals

1910.120 Hazardous waste operations and emergency response

#### **Subpart I -- Personal Protective Equipment**

1910.133 Eye and face protection

1910.134 Respiratory protection

1910.135 Occupational head protection

1910.136 Occupational foot protection

1910.138 Hand protection

#### **Subpart J -- General Environmental Controls**

1910.146 Permit-required confined spaces  
1910.147 Control of hazardous energy sources

#### **Subpart K -- Medical and First Aid**

1910.151 Medical services and first aid

#### **Subpart L -- Fire Protection**

1910.155-156 Fire protection and fire brigades  
1910.157-163 Fire suppression equipment  
1910.164 Fire detection systems  
1910.165 Employee alarm systems  
Appendices A-E of Subpart L

#### **Subpart R -- Special Industries, Electrical Power Generation, Transmission, and Distribution**

#### **Subpart Z -- Toxic and Hazardous Substances**

1910.1030 Bloodborne pathogens  
1910.1200 Hazard communication

#### **What other OSHA standards address emergency planning requirements?**

In addition to 29 CFR 1910.38(a), several other OSHA standards address emergency planning requirements. These include the 29 CFR 1910.120(q), Hazardous Waste Operations and Emergency Response; 29 CFR 1910.156, Fire Brigades; and 29 CFR 1910.146(k), Permit-Required Confined Spaces. The OSHA Publication 3122, Principal Emergency Response and Preparedness Requirements in OSHA Standards and Guidance for Safety and Health Problems, provides a broad view of emergency planning requirements across OSHA standards.

#### **What assistance does OSHA provide?**

OSHA provides a wide range of references and services to help employers and employees improve workplace health and safety and comply with regulatory requirements. These include the following:

- Education and training opportunities,
- Publications ,Electronic services,
- Free onsite consultation services, and
- Participation in the Voluntary Protection Programs.

To file a complaint, report an emergency, or seek OSHA advice, assistance, or products, call 1-800-321 OSHA or your nearest regional office, listed in Appendix 1. The teletypewriter (TTY) number is 1-877-889-5627.

Information on these and other OSHA programs and services is posted on the agency website at [www.osha.gov](http://www.osha.gov).

#### **What education and training does OSHA offer?**

OSHA area offices offer a variety of information services including publications, audiovisual aids, technical advice, and speakers for special engagements.

In addition, OSHA's Training Institute in Des Plaines, IL, provides basic and advanced courses in safety and health for federal and state compliance officers, state consultants,

federal agency employees, and private-sector employers, employees, and their representatives.

Due to the high demand for OSHA Training Institute courses, OSHA Training Institute Education Centers also offer them at sites throughout the United States. These centers are nonprofit colleges, universities, and other organizations selected through a competitive process.

OSHA also provides grants to nonprofit organizations to conduct specialized workplace training and education not available from other sources. Grants are awarded annually. Recipients contribute 20 percent of the total grant cost.

For more information on grants, training, and education, contact the OSHA Training Institute, Office of Training and Education by mail at 1555 Times Drive, Des Plaines IL 60018; by phone at (847) 297-4810, or by fax at (847) 297-4874.

### **What other publications does OSHA offer?**

OSHA offers more than 100 documents, including brochures, fact sheets, posters, pocket cards, flyers, technical documents, and a quarterly magazine. These documents are available online at [www.osha.gov](http://www.osha.gov) or by calling (202) 693-1888. Among the titles are the following:

- Access to Medical and Exposure Records -- OSHA 3110
- All About OSHA -- OSHA 2056
- Chemical Hazard Communication -- OSHA 3084
- Consultation Services for the Employer -- OSHA 3047
- Controlling Electrical Hazards -- OSHA 3075
- Employer Rights and Responsibilities Following an OSHA Inspection -- OSHA 3000
- Employee Workplace Rights -- OSHA 3021
- Hazardous Waste and Emergency Response -- OSHA 3114
- Job Hazard Analysis -- OSHA 3071
- OSHA Handbook for Small Business -- OSHA 2209
- Personal Protective Equipment -- OSHA 3077
- Respirator Protection -- OSHA 3079

### **What electronic services does OSHA provide?**

OSHA standards, interpretations, directives, and additional information are posted on the agency's website at [www.osha.gov](http://www.osha.gov). Visits to the site continue to increase, with nearly 1.4 million visitors using the site each month for a total of 23 million hits.

Among the popular Internet offerings are electronic tools to help small businesses understand and comply with OSHA regulations and promote safety and health in their workplaces. These e-Tools include the Expert Advisors, interactive software programs that help businesses identify workplace hazards. By answering a few simple questions on their computer screens, employers get reliable answers on how OSHA regulations apply to their unique work sites.

Another popular Internet product is eCATS, OSHA's electronic Compliance Assistance Tools, which help businesses identify and correct workplace hazards. A totally new generation of e-Tools coming soon will combine both decision tree logic software and graphics, giving users enhanced capabilities and the best of both worlds.

In addition, a wide variety of OSHA materials including standards, interpretations,

directives, and more can be purchased on CD-ROM from the Government Printing Office. To order, write to Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. Specify OSHA Regulations, Documents and Technical Information on CD-ROM, (ORDT), S/N 7291300000-5. The price is \$45 per year (\$57.50 overseas); single copy \$17 (\$21.25 overseas).

### **What free onsite consultation services does OSHA provide?**

The OSHA Consultation Service offers free onsite safety and health consultation services to help employers establish and maintain safe and healthful workplaces. The service is funded largely by OSHA and is delivered by professional safety and health consultants within state governments. Developed primarily for smaller employers with more hazardous operations, the service includes an appraisal of all mechanical systems, physical work practices, environmental workplace hazards, and all aspects of the employer's job safety and health program.

The onsite consultation program is separate from OSHA's inspection efforts. No penalties are proposed or citations issued for safety or health problems identified by an OSHA consultant. The service is confidential. The employer's and firm's name, and any information about the workplace, including any unsafe or unhealthful working conditions the consultant identifies, are not reported routinely to the OSHA inspection staff. The employer, however, is obligated to correct any serious job safety and health hazards identified in a timely manner, and commits to do so when requesting the service.

For more information, see Appendix 3 for a list of contact telephone numbers.

### **What are the Voluntary Protection Programs?**

The Voluntary Protection Programs, or VPPs, recognize and promote effective safety and health program management. Companies in the VPP have strong safety and health programs, implemented and managed cooperatively by their management and labor forces in cooperation with OSHA. Sites approved for VPP's three programs -- Star, Merit, and Demonstration -- meet and maintain rigorous standards. Benefits to participants include the following:

- Lost-workday case rates generally 60 to 80 percent below industry averages;
- Reduced workers' compensation and other injury- and illness-related costs;
- Improved employee motivation to work safely, leading to better quality and productivity;
- Positive community recognition and interaction;
- Further improvement and revitalization of already good safety and health programs; and
- Partnership with OSHA.

For more information, contact the VPP manager in your OSHA regional office, visit OSHA's website, or see Appendix 1 for a list of telephone numbers.

### **What partnership opportunities does OSHA provide?**

OSHA has initiated partnerships with employers, employees, and employee representatives in a wide range of industries to encourage, assist, and recognize efforts to eliminate workplace hazards. Participants work together to identify a common goal, develop plans to achieve it, and implement those plans in a cooperative way. Partnerships can transform relationships between OSHA and an employer or entire industry. Former adversaries recognize that working together to solve workplace safety

and health problems is to everyone's advantage.

For more information, contact your OSHA regional office. See Appendix 1 for a list of telephone numbers.

### **What is the value of a good safety and health program?**

A good, effectively managed worker safety and health program can be a big factor in reducing work-related injuries and illnesses and their related costs. OSHA offers voluntary guidelines to help employers and employees in workplaces it covers develop effective safety and health programs. Safety and Health Program Management Guidelines (Federal Register 54(18): 3908-3916, January 26, 1989) identifies four general elements critical to a successful safety and health management program. These are:

- Management leadership and employee involvement;
- An analysis of worksite hazards;
- Use of hazard prevention and control initiatives; and
- Safety and health training.

These guidelines are posted on the OSHA website at [www.osha.gov/FedReg\\_osha\\_data/FED19890126.html](http://www.osha.gov/FedReg_osha_data/FED19890126.html). See also OSHA's Safety and Health Management Systems eCAT at [www.osha.gov/SLTC/safetyhealthecat/index.html](http://www.osha.gov/SLTC/safetyhealthecat/index.html).

### **What is the role of state programs?**

The *Occupational Safety and Health Act of 1970* encourages states to develop and operate their own job safety and health plans. States that do so must adopt standards and enforce requirements that are at least as effective as federal requirements. Twenty-four states and two territories have adopted their own plans, three of which cover only public employees. For more information, visit OSHA's website and see Appendix 2 for a listing of states and territories with approved plans.

### **What other groups or associations can help me?**

Various organizations can provide you with safety and health information that may help you in formulating your emergency action plan. A few are listed here.

#### **Safety Data Sheets, Guides and Manuals**

- AIHA Hygienic Guide Series. American Industrial Hygiene Association, 2700 Prosperity Avenue, Fairfax, VA 22031.
- ANSI Standards, Z37 Series, Acceptable Concentrations of Toxic Dusts and Gases. American National Standards Institute, 11 West 42<sup>nd</sup> Street, New York, NY 10036.
- ASTM Standards and Related Material. American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

#### **Safety Standards and Specifications Groups**

- American National Standards Institute, 11 West 42<sup>nd</sup> Street, New York, NY 10036. Coordinates and administers the federal voluntary standardization system in the United States.
- American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103. The world's largest source of voluntary consensus standards for materials, products, systems, and services.

## Fire Protection Organizations

- Factory Insurance Association, 85 Woodland Street, Hartford, CT 06105. Composed of capital stock insurance companies that provide engineering, inspection, and loss-adjustment services.
- Factory Mutual System, 1151 Boston-Providence Turnpike, Norwood, MA 02062. An industrial fire protection, engineering, and inspection bureau established by mutual fire insurance companies.
- National Fire Protection Association, 470 Batterymarch Park, Quincy, MA 02269. A clearinghouse for information on fire protection and prevention as well as NFPA standards.
- Underwriter Laboratories, Inc., 207 East Ohio Street, Chicago, IL 60611. A nonprofit organization that publishes annual lists of manufacturers that provide products meeting appropriate standards.

## **EXERCISES**

# Student Worksheet

|               |  |
|---------------|--|
| Student Name: |  |
|---------------|--|

|                     |  |
|---------------------|--|
| Learning Objective1 |  |
| Learning Objective2 |  |
| Learning Objective3 |  |
| Learning Objective4 |  |

## Reasons to plan for an Emergency:

|    |  |
|----|--|
| 1. |  |
|    |  |
| 2. |  |
|    |  |
| 3. |  |
|    |  |
| 4. |  |
|    |  |







## INCIDENT COMMAND VIDEO NOTES:



**Osha.gov notes (what I learned):**

**Things I learned form [www.ready.gov](http://www.ready.gov) internet exercises:**

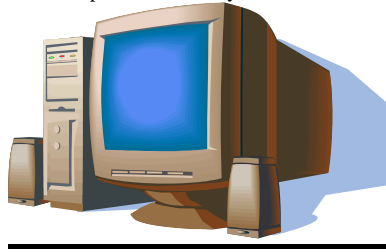
**Contact List from internet exercises:**

-  Poison Control-
-  FBI-
-  FEMA-
-  NRC-
-  CDC-
-  Department of Health-

**Additional Thoughts:**

## **Internet Group Exercises**

To help build necessary research skills



**Go to [www.osha.gov](http://www.osha.gov); Click “e-tools” link;**

1. Explore “Evacuation Plans and Procedure link (very briefly); On your worksheet write down one thing useful or something you learned with the group
2. Explore “Incident command System/Unified Command” link (very briefly); On your worksheet write down one thing useful or something you learned with the group

**Go to [www.drj.com](http://www.drj.com); Click “Sample Plans” link;  
Explore sample plans (very briefly)**

1. Which sample plan, template or tool might be useful to you?

**Go to [www.ready.gov](http://www.ready.gov); Click on Ready Business;**

1. Click the links under “Printer friendly Materials” one at a time and explore these publications; On your

1. Click on the “U.S. Poison Control Center Members (American Association of Poison Control Centers)” link; Scroll down to the Ohio Link and write the contact number down on your worksheet; Go back to the “Emergency Contact Page”
2. Click on the “FBI Field Office Information” link; Click ‘use your zip code or click on the image of the State of Ohio; Write down FBI contact number down on your worksheet; Go back to the “Emergency Contact Page”
3. Click on the “State Offices and Agencies of Emergency Management (FEMA)” link; Click letter O (for Ohio); Write down FEMA contact number down on your worksheet; Go back to the “Emergency Contact Page”
4. Click on the “National Response Center” link; Write down NRC contact number down on your worksheet; Go back to the “Emergency Contact Page”
5. Click on the “Other Emergency Contacts and Emergency n Notification Procedures” link; Scroll

- worksheet write down the one publication that might be useful at your worksite
2. Go back to “Ready Business” home page; Click on “Plan To Stay in Business” link; Investigate links under this heading; Skim through information within these links; On your worksheet write down several concepts that you learned that you feel are important
  3. Go back to ‘Ready Business” home page; Click on “Talk To Your People” link; Investigate links under this heading; Skim through information within these links; On your worksheet write down several concepts that you learned that you feel are important
  4. Go back to ‘Ready Business” home page; Click on “Protect Your Investment” link; Investigate links under this heading; Skim through information within these links; On your worksheet write down several concepts that you learned that you feel are important

**Go to <http://www.cdc.gov/niosh/topics/prepared>;  
Click “Emergency Contact”**

down to “How to Report an Emergency”; Write down CDC contact number down on your worksheet

6. Click on the “State and Local Health Department” link; Scroll down to Ohio and click “OHIO” link; click “Local Health Districts” link; Click the Individual Listings of Health Districts” link: Scroll down to your county and click the link; Write down your local health district contact number on your worksheet
7. Explore either CDC website or ODH website with group (time permitting)

If time is permitting, groups can explore additional websites such as:

 [www.fema.gov](http://www.fema.gov)

 [www.ema.ohio.gov](http://www.ema.ohio.gov)

 [www.hhs.gov](http://www.hhs.gov)

which could be useful in obtaining information to develop and implement a plan.

# Exercise Planning Chart

|                                 |            |            |            |            |            |            |            |            |            |            |            |            |  |
|---------------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|--|
| <b>Facility Name</b>            |            |            |            |            |            |            |            |            |            |            |            |            |  |
| <b>Drill Title</b>              |            |            |            |            |            |            |            |            |            |            |            |            |  |
| <b>Date Scheduled</b>           |            |            |            |            |            |            |            |            |            |            |            |            |  |
| <b>Date Completed</b>           |            |            |            |            |            |            |            |            |            |            |            |            |  |
| <b>Purpose of Exercise</b>      |            |            |            |            |            |            |            |            |            |            |            |            |  |
| <b>Planning Event</b>           | <b>Jan</b> | <b>Feb</b> | <b>Mar</b> | <b>Apr</b> | <b>May</b> | <b>Jun</b> | <b>Jul</b> | <b>Aug</b> | <b>Sep</b> | <b>Oct</b> | <b>Nov</b> | <b>Dec</b> |  |
| Management Orientation & Review |            |            |            |            |            |            |            |            |            |            |            |            |  |
| Employee Orientation & Review   |            |            |            |            |            |            |            |            |            |            |            |            |  |
| Contractor Orientation & Review |            |            |            |            |            |            |            |            |            |            |            |            |  |
| Community Orientation & Review  |            |            |            |            |            |            |            |            |            |            |            |            |  |
| Management Table Top Ex.        |            |            |            |            |            |            |            |            |            |            |            |            |  |
| Response Team Table Top Ex.     |            |            |            |            |            |            |            |            |            |            |            |            |  |
| Walk-through Drill              |            |            |            |            |            |            |            |            |            |            |            |            |  |
| Functional Drill                |            |            |            |            |            |            |            |            |            |            |            |            |  |
| Evacuation Drill                |            |            |            |            |            |            |            |            |            |            |            |            |  |
| Full Scale Exercise             |            |            |            |            |            |            |            |            |            |            |            |            |  |
| Review & Evaluation             |            |            |            |            |            |            |            |            |            |            |            |            |  |
| <b>Internal Resources</b>       |            |            |            |            |            |            |            |            |            |            |            |            |  |
| <b>External Resources</b>       |            |            |            |            |            |            |            |            |            |            |            |            |  |
| <b>Drill Control Resources</b>  |            |            |            |            |            |            |            |            |            |            |            |            |  |
| <b>Media Interest</b>           |            |            |            |            |            |            |            |            |            |            |            |            |  |
| <b>Community Interest</b>       |            |            |            |            |            |            |            |            |            |            |            |            |  |

## Business Park Scenario

You are the president / CEO of a business that sells food service supplies. Your company has 25 full time employees. The company is located within a business park. There are a wide range of industries within the business park. You hear that a fire has started at a business located near your facility. To assess the situation, you immediately send one of your employees over to where the fire has occurred. When the employee returns, you are informed that local response authorities have ordered a shelter in place for the immediate residential and business area located near the fire. Why do you need *Shelter in Place*? You have just received a call from the Emergency Management office. They communicate to you that until further notice all businesses should be “Shelter in Place”

The facility where the emergency is located manufactures Pool Chemicals. You find out that they have had a Chlorine leak from their large above ground tank farm. The building has caught fire and other chemicals (such as corrosives and oxidizers) are involved in the emergency.

The company where the emergency has occurred is close to your boundary line. The day is cloudy with a slight breeze to the south. You have noticed the flag is blowing to the south. Your company’s primary entrance is in this direction.

Why would this emergency concern you? Your response plans include fire and weather related emergencies. Your company has food shipments ready to deliver to customers.

Should you response plans just include emergencies that happen at your facility?

Why is important to understand and plan for other types of emergencies?

Why is important to understand what neighborhood businesses could encounter?

What agencies can you use to help find out critical information about companies within the community?



## Governmental Scenario

A citizen of a particular County is sentenced to community service. The citizen reports to the department to serve out their time as set forth by the Judge. The department head asks the citizen to start cleaning the bathrooms of a multiple floor complex. The citizen is shown the cart with all of the chemicals necessary to clean the bathrooms. The citizen is given no instructions on the proper use of these chemicals.

The Citizen starts to clean each bathroom and knows that it is going to be a long day. He starts to place toilet bowl cleaner (Hydrochloric Acid) in each toilet bowl. That did not work as fast as he had hoped. So he starts to play pseudo chemist by adding Ammonia and Bleach (Sodium Hypochlorite) to each bowl. He feels that this is an easy way to clean all of the bathroom toilets. He thinks nothing of mixing these chemicals since they are just cleaning chemicals we all use at home. He repeats this procedure for all the toilets on the first floor and second floor. Unbeknownst to him the chemical reaction starts to take place. The resulting reaction caused a release of Chlorine Gas throughout the complex making people sick. When it was discovered what had happened, it was already too late. The local Fire Department was called to assist with the incident. The local news press was on scene but not clearly identified. The entire building had to be evacuated and 18 people (14 staff and 4 private citizens) were sent by ambulance to the Hospital. The remaining staff and citizens at the incident were treated for a chemical exposure to the lungs and skin. They were sent home to see their own doctors for follow up treatment as needed.

The press had started to gain information from staff that came out of the building until a member of management stopped this practice. A news conference was held later that day and minimal information was shared with the press by the appropriate staff members.

What went wrong with this scenario?

Why did the citizen not get appropriate training before being allowed to use the chemicals on the cart?

Why did the supervisor of that department not check up on the citizen?

## Call Center Scenario

A midsized call center company has a stable body of employees along with a steady flow of temporary employees to help with seasonal peaks in call volume. During the preparation of a company Thanksgiving meal, the company kitchen catches on fire. The fire alarm sounds and the employees all go to the back of the building at the designated rallying point. Managers and team leaders check to make sure their personal are all accounted for, report this to the emergency response team leader, and when the fire department arrives he reports there are no missing employees. The firemen go into the company and contain the fire rather quickly. As the fire chief does a quick inspection of the building, he comes across a temporary employee in an enclosed file room wearing headphones and filing a stack of customer files. The temporary employee had started working for the company that morning, and the supervisor assigned to him had an appointment during the fire. The supervisory showed the temporary employee the file room and only gave him instructions of what work to accomplish. The supervisor was in a rush, and told the temporary employee he would be given a more detailed orientation later in the day. The employee was not hurt, and totally unaware of the fire, until the fire chief entered the file room.

What did this company do right?

What did this company do wrong?

What procedure/plan should they have had in place?

## Trailer Fire Scenario

A company that repairs over the road semi-trailers performed a repair on a moving company's trailer. It was loaded with family furniture and personal possessions. It was discovered that the trailer was leaking while the load was in transit, and it was decided to repair before delivery to prevent any weather related damage to the customer's belongings.

Late in the afternoon, just before the close of business, the outer skin of the trailer was welded inside the shop. The trailer had been pad locked to protect the family possessions. The trailer was locked in the shop as the crew went home for the evening.

When the shop opened for business the next day, smoke originating from inside the trailer filled the shop. The fire alarm was activated and all employees, including the office staff, evacuated the building and reported to their predetermined location. During the evacuation, the trailer was pulled outside the shop into the lot behind the building.

When the fire department arrived, their first action was to cut the padlock off the trailer and throw open the doors of the trailer. The oxygen from the outside air fully ignited the contents of the trailer. It quickly became a total loss. There was no damage to the company's building and there were no injuries reported (from either the company or fire department).

What did this company do right?

What did this company do wrong (hint: fire watch)?

## Potential Chemical Incident Scenario

Your company manufactures a new and improved residential line of insect killer. R&D has been trying to improve this new line of bug killer and one of the chemicals they use is Methyl Isocyanate. When adding this chemical to the insect killer it has a better kill ratio. Management has decided to add a bulk above ground storage tank. This material is a chemical that requires Risk Management and Process Safety plans. List some of the pre-planning that will be required for this chemical?

(Hint: This Chemical is made by Dow Corning)

[http://yosemite.epa.gov/oswer/ceppoehs.nsf/Alphabetical\\_Results!OpenView&Start=175](http://yosemite.epa.gov/oswer/ceppoehs.nsf/Alphabetical_Results!OpenView&Start=175)

Vulnerability Analysis Study:

Residential community- 1 mile NE of the Facility

Shopping Center – 2.5 miles South

Elementary School – 1.5 miles South West

Local Fire Department (no hazmat)– Paid , 4 miles east

Local Hospital – 100 bed (no hazmat accepted)

The Bulk tank which contains Methyl Isocyanate is 5000 gallons in size. The tank is only filled about every six months. The tank is filled by rail car. This is potentially the most hazardous condition- due to leakage and/or spills. The unloading process requires at least two employees in attendance at all times.

There may be a homeland security plan required also?

<http://www.bhopal.org/whathappened.html>

Explain some of the preparedness plans needed to communicate emergency procedures for this chemical?

What other standards may affect your company because of this chemical?

How would you communicate your intentions to the community?

## Sheet Paper Company Scenario

You are the Safety and Risk Manager for a company that manufactures Sheet paper. You have recently completed a risk audit by your insurance carrier. Some of the items that the auditors considered 'risky' were storage of waste paper in large bins. They are collected for a bailer operation. The bailed paper is sent to a recycling company. Some of the paper used in the bailer accumulates and could possibly cause a fire. Another concern of the auditors is the storage of waste oil. It is collected from machines and then stored in 55 gallon drums, near the bailer area. There are approximately 15-20 drums stored at one time.

Your home phone rings at 11:45 pm. The call is from the plant manager. He is pretty upset. He just got a call from security and a fire has started inside the plant. To his knowledge everyone has been evacuated, but he wants you down at the scene immediately.

When you arrive at the plant a fire chief has set-up a command post. You immediately go over there. You find out the Chief is now assessing a plan to use for the incident. They have no preplan for your building and now are asking very technical questions such as: critical equipment and where hazardous conditions exist.

What information can you share with the outside response authorities?

The local news media has now arrived on the scene and have been asked to stay upwind of the incident. They are very anxious for a story.

The fire Chief states that without any company information and maps, they will just control the scene. Firemen will cool the fire and stay back to control the perimeter, making sure the fire does not spread. The fire will be considered a loser within the fire departments guidelines. This means **you will** lose the business.

He will reconsider if you can come up with critical information. With company specific information they can set a strategic plan to fight the fire and reduce the chances of having response personnel hurt.

Does your company have contingency plans for emergencies? If so what are they?

Does your company have any specialized permits?

How will your company communicate to the media?

What critical operations does your company have?

### Risk Vulnerability Chart

| Emergency Event | Probability (+) | Human Impact (+) | Property Impact (+) | Business Impact (+) | Internal/External Resources (-) | Total risk (=) |
|-----------------|-----------------|------------------|---------------------|---------------------|---------------------------------|----------------|
|                 | 1 to 10         | 1 to 10          | 1 to 10             | 1 to 10             | 1 to 10 (subtract)              | 0 to 39        |
|                 |                 |                  |                     |                     |                                 |                |
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|                             |  |
|-----------------------------|--|
| Probability                 | Defined as the likelihood of the event to occur. It has twice the weight of the other factors. In determining the likelihood use statistics available to your company and be consistent with your scoring down columns. For example: if there is a 50% chance of a fire in 20 years, and a 80% chance of a blizzard this year, convert your data to match scale. |
| Human Impact                | Defined as the likelihood of an injury (physical and emotional) to occur during event with the present safeguards and emergency plan.  |
| Property Impact             | Defined as the damage to property, materials, and merchandise in relation to a dollar amount if event would occur with present safeguards and emergency plan.  |
| Business Impact             | Defined as the loss of production, sales, or status of a company if event would occur with present safeguards and emergency plan.  |
| Internal/External Resources | Defined as resources that enable a company to combat an emergency after the fact that lessen impact. For example a fire is lessened if a company is located right next to a fire station (external) or has a fire suppression system installed (internal).   |
| Total Cost                  | The number calculated in relation to other possible emergency events that help prioritize your plan, training, and sell components [of the plan] to management.  |

### Risk Vulnerability Chart for Company XYZ

| Emergency Event                 | Probability (+) | Human Impact(+) | Property Impact(+) | Business Impact(+) | Internal/External Resources(-) | Total risk (=) |
|---------------------------------|-----------------|-----------------|--------------------|--------------------|--------------------------------|----------------|
|                                 | 1 to 10         | 1 to 10         | 1 to 10            | 1 to 10            | 1 to 10 (subtract)             | 0 to 39        |
| <b>fire</b>                     | 4               | 10              | 7                  | 5                  | 9                              | 15             |
| <b>tornado</b>                  | 4               | 7               | 9                  | 8                  | 5                              | 23             |
| <b>flood</b>                    | 8               | 5               | 6                  | 4                  | 6                              | 17             |
| <b>blizzard</b>                 | 8               | 2               | 1                  | 6                  | 5                              | 12             |
| <b>complete network failure</b> | 9               | 1               | 2                  | 8                  | 3                              | 17             |
| <b>hostage situation</b>        | 3               | 7               | 1                  | 6                  | 4                              | 13             |
| <b>Power Outage</b>             | 9               | 1               | 1                  | 8                  | 1                              | 18             |

You can see from this example that this company should work on a plan to protect the company from a tornado first. Your companies' chart would have far more emergency events, along with the possibility of breaking down general emergency events in this example into more specific emergency events. Management would have to figure probabilities, impact, and resources with the best information they have. The goal is to have data to support your plan, not arbitrary numbers. Whether you use a chart similar to this, or your own system, management will be willing to spend money if you show them how planning for an emergency increases the survival ability of a company. Additionally, time should be spent training employees on what they do not know instead of having the same fire drill at the same time every year.

### Risk Vulnerability Chart

| Emergency Event | Probability (+) | Human Impact (+) | Property Impact (+) | Business Impact (+) | Internal/External Resources (-) | Total risk (=) |
|-----------------|-----------------|------------------|---------------------|---------------------|---------------------------------|----------------|
|                 | 1 to 10         | 1 to 10          | 1 to 10             | 1 to 10             | 1 to 10 (subtract)              | 0 to 39        |
|                 |                 |                  |                     |                     |                                 |                |
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## 6 Dry Runs

Another sign to watch for is “dry runs.” Before execution of the final operation or plan, a practice session will be run to work out the flaws and unanticipated problems. A dry run may be the heart of the planning stage of a terrorist act. If you find someone monitoring a police radio frequency and recording emergency response times, you may be observing a dry run. Multiple dry runs are normally conducted at or near the target area.



monitoring a police radio frequency and recording emergency response

## 7 Deploying Assets/Getting into Position

The seventh and final sign to look for is someone deploying assets or getting into position. This is a person’s last chance to alert authorities before the terrorist act occurs. It is also important to remember that pre-incident indicators may come months or even years apart. Therefore, it is extremely important to document every fragment of information, no matter how insignificant it may appear, and forward this information to the Ohio Homeland Security tipline at 877-OHS-INTEL.



Ohio Homeland Security  
is a division within the  
Ohio Department of Public Safety

1970 West Broad Street  
Columbus, Ohio 43223  
614-387-6171

[www.homelandsecurity.ohio.gov](http://www.homelandsecurity.ohio.gov)

Strategic Analysis and Information Center

# SAIC

TIP LINE TOLL-FREE:  
614-799-3555  
877-OHS-INTEL (877-647-4683)

Bob Taft, Governor  
State of Ohio

Kenneth Morckel, Director  
Ohio Department of Public Safety

John Overly, Executive Director  
Ohio Division of Homeland Security

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OHIO HOMELAND  
SECURITY

# Seven Signs of Terrorism

## 1 Surveillance

If there is a specific target that terrorists have chosen, that target area will most likely be observed during the planning phase of the operation. This is done to determine the strengths, weaknesses and number of personnel that may respond to an incident. Routes to and from the target are usually established during the surveillance phase. It is important to note suspicious actions such as someone recording or monitoring activities, drawing diagrams or annotating on maps, using vision-enhancing devices, and having in one's possession floor plans or blueprints of places such as high-tech firms, financial institutions, or government/military facilities. Any of these surveillance-type acts *MAY* be an indicator that something is not right and should be reported immediately. Nothing is too menial.



## 2 Elicitation

The second sign or signal is elicitation. This includes anyone attempting to gain information about a place, person or operation. An example is someone attempting to gain knowledge about a critical infrastructure like a power plant, water reservoir or a maritime port. Terrorists may attempt to research bridge and tunnel usage, make unusual inquiries concerning shipments or look into how a military base operates. They may also attempt to place "key" people in sensitive work locations.



## 3 Tests of Security

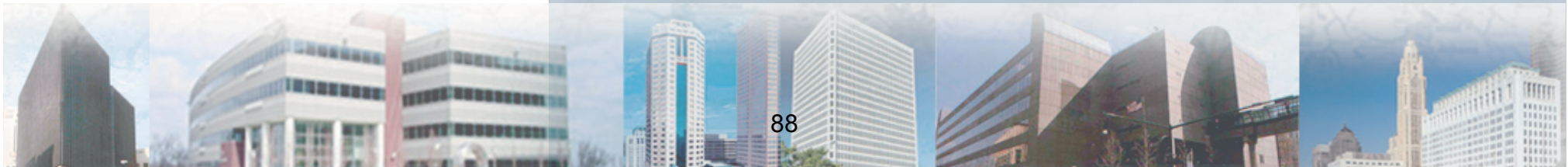
Tests of security are another area in which terrorists would attempt to gather data. This is usually conducted by driving by the target, moving into sensitive areas and observing security or law enforcement response. Items of interest would include the time in which it takes to respond to an incident or the routes taken to a specific location. Terrorists may also try to penetrate physical security barriers or procedures in order to assess strengths and weaknesses. Often, legitimate employment is gained at key locations to monitor day-to-day activities and gather detailed knowledge in order to make their mission or scheme more effective.

## 4 Acquiring Supplies

It may be a case where someone is purchasing or stealing explosives, weapons or ammunition. It could be someone storing harmful chemical equipment. Terrorists would also find it useful to acquire law enforcement equipment and identification, military uniforms and decals, as well as flight passes, badges or even flight manuals. If they cannot find the opportunity to steal these types of things, they may try to photocopy identification badges or attempt to make passports or other forms of identification by counterfeiting. Any of these items would make it easier for one to gain entrance to secured or usually prohibited areas.

## 5 Suspicious People Who Don't Belong

Another pre-incident indicator is observing suspicious people who just "don't belong." This does not mean we should profile individuals, but does mean we should profile behaviors. This includes suspicious border crossings, stowaways aboard a ship or people jumping ship in a port. It may mean having someone in a workplace, building, neighborhood or business establishment that does not fit in because of demeanor, language usage or unusual questions he/she is asking.





# SAIC

## STRATEGIC ANALYSIS AND INFORMATION CENTER

The Ohio Homeland Security Strategic Analysis and Information Center will facilitate effective terrorism-related information and intelligence sharing, working with and supporting local, state and federal governmental agencies, public and private sectors and the citizens of Ohio.

**TOLL-FREE:**  
**877-OHS-INTEL (877-647-4683)**

### PARTICIPATING AGENCIES

Buckeye State Sheriffs' Association  
Bureau of Alcohol, Tobacco, Firearms and Explosives  
Columbus Division of Fire  
Columbus Division of Police  
Columbus Police Homeland Security Section Terrorist Early Warning Group  
Defense Criminal Investigative Service  
Federal Bureau of Investigation  
Franklin County Terrorist Early Warning Group  
Hamilton County Terrorist Early Warning Group  
Ohio Association of Chiefs of Police  
Ohio Bureau of Criminal Identification and Investigation  
Ohio Department of Agriculture  
Ohio Department of Health  
Ohio Department of Natural Resources  
Ohio Department of Rehabilitation & Correction  
Ohio Department of Transportation  
Ohio Emergency Management Agency  
Ohio Emergency Medical Service  
Ohio Environmental Protection Agency  
Ohio Fire Chiefs Association  
Ohio National Guard  
Ohio State Highway Patrol  
Secret Service  
State Fire Marshal Division  
Transportation Security Administration  
United States Attorneys' Offices  
United States Coast Guard  
West Jefferson Fire Department



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Strategic Analysis and Information Center

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**614-799-3555**




# SAIC

**OHIO STRATEGIC ANALYSIS  
AND INFORMATION CENTER**

**TOLL-FREE: 877-OHS-INTEL**

# OHIO STRATEGIC ANALYSIS AND INFORMATION CENTER



The Ohio Homeland Security Division contributes to the prevention, detection, deterrence and response to terrorist activities in a number of ways. Central to any successful interdiction of terrorists is the ability to effectively collect and share information from many different sources.

Vital links to build intelligence on terrorist operations come from traditional agencies and from non-mainstream information services. To this end, the Ohio Division of Homeland Security has created the Strategic Analysis and Information Center to facilitate effective terrorism-related information and intelligence sharing.

## PRIMARY OBJECTIVE

The SAIC is a team of local, county, state, federal and private sector jurisdictions determined to make a difference. The primary objective of the SAIC is to function as a “one-stop-shop” for terrorism-related information for the State of Ohio.

The SAIC serves as a secure central fusion process for the collection, filtering, analysis and dissemination of terrorism-related information. The SAIC integrates existing local, state, federal, public and private sectors. The resulting analysis is distributed not from the point of view of any one agency, but from a neutral homeland security perspective.

Working as partners with the Federal Department of Homeland Security, the SAIC also establishes and maintains the capability to monitor, prevent and respond to potential threats. DHS maintains daily contact with Ohio Homeland Security, supplying critical guidance and intelligence, helping ensure the State of Ohio is fully informed and prepared.

The SAIC refers terrorist specific “criminal” intelligence to five FBI Joint Terrorism Task Forces, which are located in the major urban areas of Ohio. The JTTFs consist of representatives of federal, local, county and state law enforcement agencies. Viewed as the nation’s clearinghouse for criminal investigations relating to terrorism activities, each JTTF has its own investigative and analytical staff.

## SAIC PRODUCTS

- Serve as catalyst and facilitator for effective exchange of information, traditional and non-traditional sources
- Operating and responding to toll-free 877-OHS-INTEL tip line/hotline
- Issue alerts as appropriate to various sectors
- Issue reports on trends, technology, success stories, daily/monthly summaries
- Electronically file, catalog and cross-reference sensitive intelligence bulletins, advisories and alert messages for access by law enforcement
- Relay bulletins, advisories and alerts to all sectors as appropriate
- Compile threat assessments
- Maintain a state map situational status display at all times
- Assess threat levels for special events around the state
- Maintain a secure communications facility
- Offer secure storage for classified information and equipment
- Flash notification abilities for various sectors
- Maintain an emergency contact list of critical agency officials
- Implement activations of the statewide law enforcement response plan
- Maintain personnel and equipment inventory related to the law enforcement response plan
- Collect, collate, filter, analyze, disseminate and review critical terrorist-related information from all sources
- Monitor evolving terrorist-related activities
- Sponsor information-sharing meetings throughout the state
- Promote information-sharing best practices

It is important to be prepared for emergencies. Emergencies include natural ones like tornadoes or earthquakes; other types include man-made ones such as biological, chemical, or nuclear emergencies.

### READY IN 3

We don't know when an emergency will happen. But there are things we can do to prepare for emergencies of any kind. Preparing now will help protect you and your family in the future. **Ready in 3** is an easy way to learn how to prepare for an emergency.

#### Ready in 3 includes three steps

- ◆ Create a plan for you, your family, and your business.
- ◆ Prepare a kit for home, car and work.
- ◆ Listen for information about what to do and where to go during an actual emergency.

This brochure will help you learn about three types of emergencies: **biological**, **chemical**, and **nuclear**.

### BIOLOGICAL EMERGENCIES

Bacteria, viruses, and poisons made by bacteria can cause biological emergencies. They can be sprayed into the air or put into food sources or drinking water. They can also be spread by person-to-person contact.

#### What should I do during a biological emergency?

Listen to a radio, television, or an emergency-alert system for instructions. Have a battery-powered radio available, if needed. Officials will tell you whether to stay inside or leave your home. They will tell you where to go if you need to leave your home.

Columbus and Metropolitan Medical Response System  
C/O Columbus Health Department  
Office of Emergency Preparedness  
240 Parsons Avenue  
Columbus, Ohio 43215  
614-645-7089

The Columbus & Metropolitan Medical Response System is a partnership among Columbus and Franklin County: law enforcement, fire departments, emergency medical services, emergency management agencies, emergency response agencies, public health organizations, hospitals, and other community partners. These groups also work closely with response and planning agencies throughout the State of Ohio.



Ready in 3 information is available in English, Spanish and Somali. This brochure and other emergency preparedness materials are available on the Columbus Health Department's website at [www.publichealth.columbus.org](http://www.publichealth.columbus.org) and at the Columbus Health Department's Community Resource Center located at 240 Parsons Avenue, Columbus, Ohio 43215.

Special arrangements can be made for persons with disabilities to access information by calling the Columbus & Metropolitan Medical Response System located in the Office of Emergency Preparedness at the Columbus Health Department (614) 645-7089.

Ready in 3 was originally designed and created by the Missouri Department of Health and Senior Services in March 2004 to educate Missourians on preparing for emergencies.  
Rev 6.29.05

COLUMBUS AND METROPOLITAN  
MEDICAL RESPONSE SYSTEM



## BIOLOGICAL, CHEMICAL AND NUCLEAR EMERGENCY THREATS

## WHAT YOU NEED TO KNOW





### Will a biological emergency make me sick?

You may not know right away if you were exposed to the germs or poisons that caused the emergency. Symptoms depend on the type of germ or poison that caused the emergency. Some common signs include trouble breathing and flu-like symptoms. If you feel sick, call your doctor right away. They may tell you to:

- ◆ Take off your clothes and put them in a plastic bag
- ◆ Wash yourself with soap and water
- ◆ Put on clean clothes

### What should I do after a biological emergency?

Continue to listen to the radio, television, or emergency-alert system for instructions.

## CHEMICAL EMERGENCIES

**C**hemical emergencies happen when the air is poisoned with harmful chemicals or when chemicals are put into food sources or drinking water. These chemicals can be breathed in or absorbed through the skin.

### What should I do during a chemical emergency?

Listen to a radio, television, or an emergency-alert system for instructions. Have a battery-powered radio available, if

needed. Officials will tell you whether to stay inside or leave your home. They will tell you where to go if you need to leave your home. You may be told to stay at home and:

- ◆ Turn off all ventilation systems. This includes furnaces, air conditioners, vents, and fans
- ◆ Stay in an inside room with no windows. Make sure there is enough space for everyone in the room.
- ◆ If instructed, seal the room openings with heavy-duty tape and plastic sheets. Room openings include doors and all vents.

### Will a chemical emergency make me sick?

During a chemical emergency, you may have some of these symptoms:

- ◆ Watery eyes
- ◆ Burning feeling on your skin
- ◆ Trouble breathing
- ◆ Twitching
- ◆ Choking
- ◆ Trouble walking in a straight line
- ◆ Confusion

If you have these symptoms, call your doctor right away. If you have watery eyes and burning skin, you should:

- ◆ Take off your clothes and put them in a plastic bag.
- ◆ Wash yourself with soap and water, but do NOT scrub your skin.
- ◆ Put on clean clothes.
- ◆ Call your doctor right away.

### What should I do after a chemical emergency?

Continue to listen to the radio, television, or emergency-alert system for instructions.

## NUCLEAR OR RADIATION EMERGENCIES

**P**eople are exposed to very small amounts of radiation every day. Nuclear or radiation emergencies could expose people to large amounts of radiation, depending on the type of emergency.

A radiation emergency could include a nuclear power plant accident, the explosion of a small nuclear device, or a dirty bomb. A dirty bomb is an explosive, like dynamite, that contains radioactive materials.

### What should I do during a radiation emergency?

Officials will monitor the amount of radiation and decide what to do. Listen to a radio, television, or an emergency-alert system for instructions. Have a battery-powered radio available, if needed. Officials will tell you whether to stay inside or leave your home. You may be told to stay at home and:

- ◆ Close and lock all doors and windows.
- ◆ Turn off all ventilation systems. This includes furnaces, air conditioners, vents, and fans.

- ◆ Stay in an inside room with no windows. Make sure there is enough space for everyone in the room

If you are told to leave, follow the instructions that your local officials provide and take your emergency kit.

### Will a radiation emergency make me sick?

Dirty bombs probably do not have enough radiation to make you sick. The main danger is the blast. But a large nuclear explosion could make you sick. It can take from several hours to days for any signs to appear. Some people have no symptoms. Others have only one or two symptoms. Some common symptoms include:

- ◆ Reddening of the skin
- ◆ Feeling sick or throwing up
- ◆ Diarrhea
- ◆ Feeling very tired
- ◆ Headache
- ◆ Sore mouth or bleeding gums

If you feel sick, call your doctor right away.

### What should I do after a nuclear or radiation emergency?

Continue to listen to the radio, television, or emergency-alert system for instructions.



## Connecting to CIMS

Ohio Homeland Security's Contact and Information Management System (CIMS) provides users with a secure "one-stop-shop" source for receiving relevant and timely homeland security as well as all-hazards information.

CIMS is available to public and private sector officials who are involved with terrorism prevention, response, mitigation and recovery efforts.

For CIMS access, please contact Mary Tyler at 614-644-3895 or [MPTyler@dps.state.oh.us](mailto:MPTyler@dps.state.oh.us)



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[www.homelandsecurity.ohio.gov](http://www.homelandsecurity.ohio.gov)

Bob Taft, Governor  
State of Ohio

Kenneth L. Morckel, Director  
Department of Public Safety

John Overly, Executive Director  
Ohio Homeland Security



# CIMS

Contact and Information  
Management System

# CIMS

## Contact and Information Management System

The secure method to receive relative Homeland Security and all-hazards information.



In 2003, Ohio Homeland Security launched a new resource to provide public and private sectors with a secure means of obtaining information in a “one-stop-shop” repository. It is called the **Contact and Information Management System (CIMS)**.

**CIMS** is a centralized, cross-functional repository for Homeland Security information sharing as well as a secure means to disseminate timely and relevant information to multi-disciplines and jurisdictions across the state of Ohio. **CIMS** allows alerts and/or messages to be sent to various jurisdictions and disciplines simultaneously.

### SECURITY

**CIMS** is password protected and is located behind a secured socket layer (SSL). SSL creates a secure connection to provide content security. Upon activation of the **CIMS** account, a user name and password is generated.



### CIMS CONTENT

**CIMS** combines various powerful resources for information sharing needs.

- 1 **Web Based Application** - Access to CIMS can be obtained from any internet connection.
- 2 **Secure Portal** - CIMS is located behind a secured socket layer to ensure content security.
- 3 **Current Alerts and BOLOS (Be on the look out for)** - Current time sensitive, high priority alerts and BOLOS are posted to the CIMS Law Enforcement homepage.
- 4 **Current Bulletins** - Intelligence and Informational bulletins containing current event information from various state, local, and federal agencies are posted on the homepage.
- 5 **General Content Information** - Reference, routine and current event information is posted to the center section of the CIMS homepage.
- 6 **Grant Information** - Homeland Security Grant Information is posted under this caption.
- 7 **Training Information** - Current “open” training information from various agencies is contained under this caption.
- 8 **Video Broadcasts** - OHS works in partnership with various agencies to provide online video Intelligence and Training briefings.





# CONTACT AND INFORMATION MANAGEMENT SYSTEM (CIMS)

Date: \_\_\_\_\_

## REQUIRED INFORMATION:

Please check one:

### Law Enforcement

- Sheriff
- Police Chief
- Bomb Squads
- State Patrol
- Police officer
- Coroners
- Federal Law Enforcement
- Special Response Teams (SWAT)
- BCI (Bureau of Criminal Investigation And Identification)

### Defense Industrial

- Weapon Manufacturers
- Ammunition Manufacturers
- Defense Contractors

### Emergency Services

- Fire
- EMS
- EMA

### Banking and Finance

- Postal and Shipping
- Food Sector
- Chemical/Refinery
- Private Security

### Transportation and Border Security

- Air
- Bus
- Maritime
- Rail
- Trucking

### Agriculture

- Veterinarian
- Farming Industry
- Livestock Industry

### Water

- Drinking Water
- Waste Water

### Public Health

- Health Department
- State
- County
- Local (City)
- Trauma Hospitals
- Hospitals

### Government

- State
  - Legislators
  - Executive Agencies
  - Judicial
- County
  - County Commissioners
  - County Judicial
- Local
  - Mayors
  - Township Trustees

### Education

- School Boards
- Universities
- Public
- Private
- Vocational Schools
- School Transportation

## YOUR PRIMARY CONTACT INFORMATION:

First Name \_\_\_\_\_ Last Name: \_\_\_\_\_

Title: \_\_\_\_\_

SSN (Last 4 digits): \_\_\_\_\_ DOB: \_\_\_\_\_ Drivers License Number: \_\_\_\_\_

Department / Agency / Company Name: \_\_\_\_\_

Street Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

County: \_\_\_\_\_

Business Phone: \_\_\_\_\_ Ext: \_\_\_\_\_

Fax Number: \_\_\_\_\_

E-Mail : \_\_\_\_\_

Ohio Homeland Security Coordinator \_\_\_\_\_

**One form per person:** Please return this form to: Mary Tyler – Terrorism Awareness; Ohio Homeland Security SAIC; 1970 West Broad Street Columbus Ohio, 43223; email: [MPTyler@dps.state.oh.us](mailto:MPTyler@dps.state.oh.us) or Fax: 614-752.2419.

| WHO Phases                   |  | US Stages   | Central Ohio Regional Stages                              |
|------------------------------|--|---|---|
| <b>INTER-PANDEMIC PERIOD</b> |  |   |   |
| 1                            | No new influenza virus subtypes have been detected in humans. An influenza virus subtype that has caused a human infection may be present in animals. If present in animals, the risk of human disease is considered to be low | New domestic animal outbreak in at-risk country           | New Domestic animal outbreak in at-risk country           |
| 2                            | No new influenza virus subtypes have been detected in humans. However a circulating animal influenza poses a substantial risk of human disease.  |   |   |
| <b>PANDEMIC ALERT</b>        |  |   |   |
| 3                            | Human infection(s) with a new subtype, but no human-to-human spread, or at most rare instances of spread to a close contact  | New domestic animal outbreak in at-risk country           | New Domestic animal outbreak in at-risk country           |
|                              |  | Suspected human outbreak overseas                         | Suspected human outbreak overseas                         |
| 4                            | Small cluster(s) with a limited human-to-human transmission but spread is highly localized suggesting that the virus is not well adapted to humans   | Confirmed human outbreak overseas                         | Confirmed human outbreak overseas                         |
| 5                            | Larger cluster(s) but human-to-human spread still localized suggesting that the virus is increasingly better adapted to humans, but may not yet be fully transmissible (substantial pandemic risk).                            |   |   |
| <b>PANDEMIC PERIOD</b>       |  |   |   |
| 6                            | Pandemic phase: increased and sustained transmission in general population   | Widespread human outbreaks in multiple locations overseas | Widespread human outbreaks in multiple locations overseas |
|                              |  | First human case in North America                         | First human case in North America                         |
|                              |  |   | First human case in United States                         |
|                              |  |   | First human case in Ohio                                  |
|                              |  |   | First human case in Central Ohio Region                   |
|                              |  | Spread throughout United States                           | Widespread human outbreaks in Ohio                        |
|                              |  |   | 30% absenteeism rate                                      |
|                              |  | Recovery and Preparation for subsequent waves             | Preparation for subsequent waves                          |
| Post Pandemic                |  |   |   |

## RESOURCES

## Emergency Planning Resources

June 2007

### 1. General

#### Government web sites:

- FEMA's *Emergency Management Guide for Business and Industry*: Offers step-by-step advice on how to create and maintain a comprehensive emergency management program.  
<http://www.fema.gov/business/guide>
- Federal Emergency Management Agency (FEMA): Provides information for businesses, emergency personnel, government, etc. on emergency planning.  
<http://www.fema.gov>
- NIOSH's Emergency Response Resources page: Presents resources on a variety of emergencies for both emergency responders and employers.  
<http://www.cdc.gov/niosh/topics/emres>
- OSHA's Emergency Preparedness and Response page: Presents OSHA's resources on this topic.  
<http://www.osha.gov/SLTC/emergencypreparedness>
- OSHA's *How to Plan for Workplace Emergencies and Evacuations*, 2001: Assists employers with emergency planning.  
<http://www.osha.gov/Publications/osh3088.pdf>
- Ohio Emergency Management Agency: Coordinates activities related to disaster response and recovery in Ohio.  
<http://www.ema.ohio.gov>
- Ready Business: Provides resources for businesses on planning for emergencies.  
<http://www.ready.gov/business>
- Small Business Administration's page on disaster preparedness for small businesses.  
[http://www.sba.gov/localresources/disasteroffices/disaster\\_recov/prepared/get\\_ready.html](http://www.sba.gov/localresources/disasteroffices/disaster_recov/prepared/get_ready.html)

#### Organization web sites:

- American Red Cross's *Business & Industry Guide*: Encourages businesses to plan for all kinds of emergencies and disasters.  
<http://www.redcross.org/services/disaster>
- NFPA 1600: *Standard on Disaster/Emergency Management and Business Continuity Programs*, 2004: Establishes a common set of criteria for disaster planning for both public and private programs.  
<http://www.nfpa.org/assets/files/pdf/nfpa1600.pdf>
- Oklahoma State University's Homeland Security and Emergency Preparedness page: Presents links to a variety of resources on this topic.  
<http://www.pp.okstate.edu/ehs/hazmat/terrorism.htm>

#### Training aids:

- BWC's Video library offers hundreds of workplace safety and health videos for loan to Ohio employers. Topics include emergency preparedness, fire prevention, workplace violence, the incident command system, HAZWOPER, chemical safety and disaster cleanup safety.  
<http://www.ohiobwc.com/employer/programs/safety/VideoLibrary.asp>
- Emergency Film Group: Offers video-based training materials for hazmat & terrorism emergency response.  
<http://www.efilmgroup.com>

## 2. Incident Command System

- National Incident Management System Integration Center (FEMA): The Center oversees all aspects of NIMS including the development of compliance criteria and implementation activities at federal, state and local levels. It provides guidance and support to jurisdictions and incident management and responder organizations as they adopt the system.  
<http://www.fema.gov/emergency/nims>

## 3. Hazardous Materials/Chemical

### Web sites:

- Agency for Toxic Substances and Disease Registry (ATSDR): Provides health information to prevent harmful exposures and disease related to toxic substances.  
<http://www.atsdr.cdc.gov>
- CAMEO Chemicals: An online library of more than 6,000 data sheets containing response-related information and recommendations for hazardous materials. <http://cameochemicals.noaa.gov>
- CHEMTREC: Serves as a round-the-clock resource for obtaining immediate emergency response information for accidental chemical releases.  
<http://www.chemtrec.org/Chemtrec>
- DOT's Office of Hazardous Materials Safety: Promulgates a national safety program to minimize the risks to life and property inherent in commercial transportation of hazardous materials.  
<http://hazmat.dot.gov>
- EPA's Chemical Emergency Preparedness and Prevention: Provides info on Risk Management Plans (RMPs), Emergency Planning and Community Right-to-Know Act (EPCRA), tools and resources.  
<http://yosemite.epa.gov/OSWER/Ceppoweb.nsf/content/index.html>
- Emergency Planning for Chemical Spills: This web site is not currently being updated, but it provides a wealth of information that was compiled by several government agencies and other organizations in Arizona.  
<http://www.chemicalspill.org>
- National Clearinghouse for Worker Safety and Health Training: A resource for workers and trainers who are involved in the handling of hazardous waste

or in responding to emergency releases of hazardous materials and terrorist actions.

<http://www.wetp.org/wetp>

- National Response Center (NRC): The sole federal point of contact for reporting oil and chemical spills.

<http://www.nrc.uscg.mil>

- North American Emergency Response Guidebook: Online version

<http://hazmat.dot.gov/pubs/erg/gydebook.htm>

#### **4. Fire**

- FPP/IFSTA: Offers training materials for firefighters. <http://www.ifsta.org>
- National Fire Protection Association: Serves as the world's leading advocate of fire prevention.

<http://www.nfpa.org>

- OSHA's Fire Safety page: Provides information on OSHA fire safety standards.

<http://www.osha.gov/SLTC/firesafety>

#### **5. Natural Disasters**

- EPA's Natural Disasters Action Plan: Provides tools for planning for natural disasters.

[http://www.epa.gov/greenkit/q5\\_disas.htm](http://www.epa.gov/greenkit/q5_disas.htm)

- NOAA's emergency information page: Provides resources on severe weather emergencies.

<http://www.noaa.gov/emergency.html>

#### **6. Pandemics**

- PandemicFlu.gov: Provides comprehensive government-wide information on pandemic influenza and avian influenza.

<http://www.pandemicflu.gov>

#### **7. Mail**

- NIOSH's Handling Irradiated Mail page: Provides guidelines for opening mail that has been irradiated to eliminate biohazards.

<http://www.cdc.gov/niosh/topics/irr-mail>

- Postal Service's Security of the Mail page: Offers information concerning mailroom security and suspicious mail.

<http://www.usps.com/communications/news/security/mailcenter.htm>

#### **8. Terrorism**



- Dept. of Homeland Security: Provides the unifying core for the vast national network of organizations and institutions involved in efforts to secure the nation.  
<http://www.dhs.gov>
- *Getting Ready: Company Primer on Preparedness and Response Planning for Terrorist and Bioterrorist Attacks*, Business Executives for National Security.  
<http://www.bens.org/Getting-Ready.pdf>
- NIOSH's Emergency Preparedness for Business page: Provides resources for developing a comprehensive plan for dealing with terrorism-related events.  
<http://www.cdc.gov/niosh/topics/prepared>

## 9. Violence

- NIOSH's Occupational Violence page: Presents NIOSH's resources on this topic.  
<http://www.cdc.gov/niosh/injury/traumaviolence.html>
- OSHA's Workplace Violence page: Presents OSHA's resources on this topic.  
<http://www.osha-slc.gov/SLTC/workplaceviolence>

## 10. Business Continuance

- Association of Contingency Planners is a network of business continuity professionals.  
<http://www.acp-international.com>
- BWC's Disaster Preparedness and Business Continuance web page presents a list of resources on this topic.  
<http://www.ohiobwc.com/employer/programs/safety/DisasterLinks.asp>
- Disaster Recovery Journal: Find sample plans under "Tools."  
<http://www.drj.com>

## 11. Schools

- Ohio Resource Network for Safe and Drug Free Schools and Communities offers an online prevention information and networking support system,  
<http://www.ebasedprevention.org>.
- *School Emergency Management Guide for Teachers and Staff*, available from Prevention Tools, LLC, [www.preventiontools.net](http://www.preventiontools.net).
- School safety information from the Ohio Emergency Management Agency:  
[http://www.ema.ohio.gov/safe\\_schools.asp](http://www.ema.ohio.gov/safe_schools.asp)
- U.S. Dept. of Education page on planning for a variety of emergencies in schools. <http://www.ed.gov/admins/lead/safety/emergencyplan>

## 12. People with Disabilities

- Center for Disability and Special Needs Preparedness: Works to ensure that all individuals are included in the development and implementation of plans for protection from natural and man-made emergencies.  
<http://www.disabilitypreparedness.org>
- Dept. of Labor's page on emergency preparedness and people with disabilities.  
<http://www.dol.gov/odep/programs/emergency.htm>
- NFPA Emergency Evacuation Planning Guide for People with Disabilities: Features a checklist that building services managers and people with disabilities can use to design a personalized evacuation plan.  
<http://www.nfpa.org/categoryList.asp?categoryID=824&cookie%5Ftest=1>



## Pandemic Flu Preparedness

### References:

#### **Columbus Public Health:**

[http://www.publichealth.columbus.gov/emergency\\_preparedness/PandemicInfluenza.asp](http://www.publichealth.columbus.gov/emergency_preparedness/PandemicInfluenza.asp)

#### **Franklin County Board of Health:**

[http://www.co.franklin.oh.us/board\\_of\\_health/pandemic\\_flu\\_planning\\_and\\_prepar.htm](http://www.co.franklin.oh.us/board_of_health/pandemic_flu_planning_and_prepar.htm)

#### **Ohio Department of Health Pandemic Influenza:**

<http://www.ohiopandemicflu.gov/>

#### **US Pandemic Influenza:**

<http://www.pandemicflu.gov/>

#### **Center for Disease Control (CDC) and Prevention Pandemic Influenza:**

<http://www.cdc.gov/flu/avian/index.htm>

#### **World Health Organization (WHO) Avian Influenza Information:**

[http://www.who.int/csr/disease/avian\\_influenza/en/](http://www.who.int/csr/disease/avian_influenza/en/)

#### **The American Red Cross**

<http://www.redcross.org>

#### **Homeland Security**

<http://www.ready.gov/america/beinformed/influenza.html>

[http://www.ready.gov/business/\\_downloads/pandemic\\_influenza.pdf](http://www.ready.gov/business/_downloads/pandemic_influenza.pdf)

#### **US Chamber of Commerce**

<http://www.uschamber.com/issues/index/defense/pandemic/notfluasusual.htm>

If you have further questions, please contact Pandemic Influenza Coordinator Susan Campbell, MSN, RN at Columbus Public Health at 614-645-5139.

Emergency Preparedness Helpful Links:

Emergency one: <http://www.ohiopandemicflu.gov/docs/HouseholdEmergencyPlan.doc>

Family planning checklist: <http://www.pandemicflu.gov/plan/pdf/Individuals.pdf>

Household ABC's: <http://www.ohiopandemicflu.gov/docs/A-ZHousehold.pdf>

The Ready in 3 booklet:

[http://www.publichealth.columbus.gov/Asset/iu\\_files/Emergency\\_Preparedness/Readyin3/Planning\\_for\\_Emergencies\\_Booklet10.05.pdf](http://www.publichealth.columbus.gov/Asset/iu_files/Emergency_Preparedness/Readyin3/Planning_for_Emergencies_Booklet10.05.pdf)

The shelter in place card:

[http://www.publichealth.columbus.gov/Asset/iu\\_files/Emergency\\_Preparedness/Readyin3/252600\\_English.pdf](http://www.publichealth.columbus.gov/Asset/iu_files/Emergency_Preparedness/Readyin3/252600_English.pdf)

The family communication card:

[http://www.publichealth.columbus.gov/Asset/iu\\_files/Emergency\\_Preparedness/Readyin3/Business\\_Card\\_ENG.pdf](http://www.publichealth.columbus.gov/Asset/iu_files/Emergency_Preparedness/Readyin3/Business_Card_ENG.pdf)

The biological pamphlet:

[http://www.publichealth.columbus.gov/Asset/iu\\_files/Emergency\\_Preparedness/Readyin3/252602\\_English\\_Brochure.pdf](http://www.publichealth.columbus.gov/Asset/iu_files/Emergency_Preparedness/Readyin3/252602_English_Brochure.pdf)

The Franklin County Pan Flu site with Power points:

[http://www.co.franklin.oh.us/board\\_of\\_health/pandemic\\_flu\\_planning\\_and\\_prepar.htm](http://www.co.franklin.oh.us/board_of_health/pandemic_flu_planning_and_prepar.htm)



## **GLOSSARY**

## Glossary of Acronyms

### **AA - Atomic Absorption**

Absorption of electromagnetic radiation at discrete wavelengths by atoms. The quantity of absorbed radiation is a measure of the concentration or amount of that atom in the sample.

### **AAS - Atomic Absorption Spectroscopy**

Performed by stimulating a filament of a chosen element and using the light emitted by the filament to detect the amount of that element in a sample by measuring the absorption of the light.

### **AAOHN - American Association of Occupational Health Nurses**

### **ABIH - American Board of Industrial Hygiene**

The organization which conducts the testing for CIH and issues the CIH credential.

### **ABSA - American Biological Safety Association**

A professional association for the exchange of biosafety information.

### **ACC – American Chemistry Council**

An industry group which coordinates environmental, health, safety, and research programs for its members.

### **ACGIH - American Conference of Governmental Industrial Hygienists**

A Professional Association well known for establishing and publishing the TLVs, for publishing the Industrial Ventilation Manual, and as one of the sponsors of the ABIH and AIHCE.

### **ACM - Asbestos Containing Material**

### **ACS - American Chemical Society**

### **ADA - Americans with Disabilities Act**

### **ADAAG - Americans with Disabilities Act Accessibility Guidelines**

### **AE - Atomic Emission**

The emission of electromagnetic radiation at discrete wavelengths by excited atoms. Quantity of emitted light is a measure of the concentration or amount of that atom present in a sample.

### **AES - Atomic Emission Spectrophotometry**

Analysis by detection and quantification of the characteristic electromagnetic emissions from atoms in a sample.

**AFL-CIO - American Federation of Labor and Congress of Industrial Organizations**

**ADA - Americans with Disabilities Act**

**AGA - American Gas Association**

**AHERA - Asbestos Hazard Emergency Response Act of 1986 (Title II of TSCA)**  
US Federal legislation requiring all schools to determine the location and condition of asbestos containing material, and setting up procedures for issuing credentials to those who disturb asbestos for testing or removal.

**AI – Accident Investigation**

**AIHA - American Industrial Hygiene Association**

**AIHCE - American Industrial Hygiene Conference and Exposition**  
Annual, week long, professional conference jointly sponsored by the AIHA and the ACGIH in the spring.

**AIHA - American Industrial Hygiene Association**

The broad professional association for Industrial Hygienists in the US and Canada, with local sections also in parts of Europe. This association is the largest professional Industrial Hygiene/ Occupational Hygiene association in the world.

**ALARA - As Low As Reasonably Achievable**

A philosophy applied to the control of exposure to ionizing radiation.

**ALCM - Associate in Loss Control Management**

A credential issued by the Insurance Institute of America.

**ANSI - American National Standards Institute**

Publishes consensus standards on a wide variety of subjects, including safety equipment, procedures, etc.

**APF - Assigned Protection Factor**

Used in the context of respiratory protection.

**API - American Petroleum Institute**

**APIH - Association of Professional Industrial Hygienists**

Based in Tennessee, USA, this organization offers professional credentials of industrial hygienists as RIH or RPIH under the Tennessee title protection law for industrial hygiene.

**APPA - Association of Physical Plant Administrators**



A US professional association that, among its other activities, monitors government legislative and regulatory actions which may impact the academic community.

**AQTX - Aquatic Toxicity**

**APR - Air Purifying Respirator**

**ASA - Accredited Safety Auditor**

**ASAE - American Society of Agricultural Engineers**

**ASHRAE - American Society of Heating, Refrigerating and Air Conditioning Engineers**

A group that publishes a well regarded multi-volume handbook which includes ventilation guidance, and standards on IAQ and other ventilation related issues.

**ASME - American Society of Mechanical Engineers**

**ASOII - Annual Survey of Occupational Injuries and Illnesses**

**ASP - Associate Safety Professional**

Designation given to someone who has successfully completed the first half of the examination processes for CSP.

**ASSE - American Society of Safety Engineers**

The national professional society for Safety Engineers in the US.

**AST - Aboveground Storage Tank**

**ASTM - American Society for Testing and Materials**

**ATSDR - Agency for Toxic Substances and Disease Registry**

An agency of the Public Health Service in the U.S. Department of Health and Human Services.

**AWS - American Welding Society**

**AWT - Advanced Wastewater Treatment**

**BACT - Best Available Control Technology**

A term used in US environmental control regulations.

**BAT - Best Available Technology**

**BATEA - Best Available Technology Economically Achievable**

Terminology for sewage cleanup technology to be applied under Canadian Municipal-Industrial Strategy for Abatement, for cleanup of Great Lakes water sources.

**BBP - Bloodborne Pathogens**

Pathogenic microorganisms that are present in human blood and can cause disease in humans. These pathogens include, but are not limited to, hepatitis B virus (HBV) and human immunodeficiency virus (HIV).

**BBS - Behavior-Based Safety**

A safety-oriented philosophy that focuses on the observable actions of employees, as well as the objective environmental or cultural factors that influence behavior

**BCSP - Board of Certified Safety Professionals**

The certifying organization that issues the ASP, CSP, and COHST credentials following review of experience and successful completion of written tests.

**BD - 1,2-Butadiene**

**BEI - Biological Exposure Indices**

**BLEVE - Boiling Liquid Expanding Vapor Explosion**

**BLS - Bureau of Labor Statistics**

An agency of the US government that gathers statistical information on accident rates, among other things.

**BMI - Body Mass Index**

**BOD - Basic Oxygen Demand; Biological Oxygen Demand**

The oxygen demand if a water sample is biologically oxidized.

**BOHS - British Occupational Hygiene Society**

The national professional society of Occupational Hygienists in the United Kingdom.

**BOMA - Building Owners and Managers Association International**

**BP – Blood Pressure**

**BP – Boiling Point**

**BPT - Best Practicable Control Technology**

**BSC - Biological Safety Cabinet**

**BTU - British Thermal Unit**

A traditional unit of measure for heat.

**BWC – Bureau of Workers Compensation**

**CAA - Clean Air Act**

**CAP - College of American Pathologists**

**CAS - Chemical Abstract Service**

Publisher of Chemical Abstracts and other publications and services.

**CBC - Complete Blood Count**

**cc – Cubic Centimeter**

**CCC - Compromised Container Caps**

Cracked or otherwise damaged screw-on caps for chemical containers.

**CCOHS - Canadian Centre for Occupational Health and Safety**

A Canada based organization offering a collection of MSDS on CD-ROM, as well as other H&S related services.

**CCP - Cooperative Compliance Program**

**CCPS - Center for Chemical Process Safety**

An organization established by the American Institute of Chemical Engineers (AIChE) to focus on engineering practices to help prevent and mitigate catastrophic hazardous chemical accidents.

**CDC - Centers for Disease Control**

The organization within the US National Institutes of Health, Public Health Service that specializes in recognition, evaluation and control of communicable diseases. NIOSH is part of CDC.

**CDL - Commercial Driver's License**

**CEEL - Community Emergency Exposure Level**

A sort of PEL for a whole community; intended as a guideline for when evacuations are necessary in case of accidental releases.

**CEPP - Chemical Emergency Preparedness Program**

**CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act (Superfund)**

US Federal legislation establishing an EPA project to clean up hazardous material dumps. It requires generators to be responsible for how waste is ultimately disposed.

**CFC - Chlorofluorocarbons**

Any of several compounds composed of carbon, fluorine, chlorine, and hydrogen used primarily as refrigerants CFCs are thought to be ozone-depleting chemicals.

**CFM - Cubic Feet per Minute**

A unit of measure for things such as airflow that is used in evaluating ventilation systems.

**CFR - Code of Federal Regulations**

The compilation of all regulations issued by US Federal Government agencies.

**CGA - Compressed Gas Association**

**CGI - Combustible Gas Indicator**

**CHEMTREC - Chemical Transportation Emergency Center**

Provider of hazard information warnings and guidance in emergency situations.

**CHMM - Certified Hazardous Materials Manager**

A credential awarded by the Institute of Hazardous Materials Management.

**CHO - Chemical Hygiene Officer**

The Administrator of a Chemical Hygiene Plan under OSHA regulations.

**CHP - Chemical Hygiene Plan**

Required by OSHA, a statement of laboratory work practices written by each employer.

**CHP - Certified Health Physicist**

A person who deals with radiation safety on a professional level.

**CIH - Certified Industrial Hygienist**

Someone who is educated and experienced in evaluating and controlling health hazards in the workplace and community.

**CIMS – Contact and Information Management System**

**CMA - Chemical Manufacturers Association**

**CMAA - Crane Manufacturers Association of America, Inc.**

**CNS - Central Nervous System**

**COD - Chemical Oxygen Demand**

Oxygen demand if a substance is chemically oxidized.

**CPL - Compliance Directive**

A published document that offers deeper insight on an OSHA standard.

**CPR - Cardiopulmonary Resuscitation**

**CPSC - Consumer Product Safety Commission**

A U.S. Federal agency geared to protect the public from unsafe products.

**CPWR - Center to Protect Workers' Rights**

A US based advocacy group.

**CSA - Canadian Standards Association**

The national consensus standards association for Canada. It is roughly equivalent to ANSI.

**CSHO - Compliance Safety and Health Officer**

An officer of the Occupational Safety and Health Administration.

**CSP - Certified Safety Professional**

The safety equivalent to a CIH.

**CSP – Cooperative and State Programs**

Workplace health and safety programs which provide protections beyond the OSH Act.

**CTD - Cumulative Trauma Disorder**

A disorder of the musculoskeletal and nervous systems that may be caused or aggravated by repetitive motions, forceful exertions, vibration, mechanical compressions, sustained or awkward postures, or by exposure to noise over extended periods of time.

**CTS - Carpal Tunnel Syndrome**

The compression and entrapment of the median nerve where it passes through the wrist into the hand - in the carpal tunnel.

**CVS – Cardio-Vascular System**

**CWA - Clean Water Act**

**dB - Decibels**

A unit of measure of sound intensity.

**dBA - Decibels on the A scale**

Decibels on the A scale.

**DEP - diethyl phthalate**

**DFM - Dust, Fume, and Mist**

This refers to a respirator filter cartridge suitable for use against dusts, fumes, or mists, and is used in the new NIOSH regulation on Respirator Certification.

**DHHS - Department of Health and Human Services**

A Cabinet level department of the US Federal Government; the department in which CDC, and therefore NIOSH, is located.

**DHMM - Director of Hazardous Materials Management**

The person in charge of handling hazardous materials.

**DM - Dust and Mist**

This refers to a respirator filter cartridge suitable for use against dusts and mists, and is used in the new NIOSH regulation on Respirator Certification.

**DNA – Deoxyribo-Nucleic Acid**

The molecules in the nucleus of the cell that contain genetic material.

**DOE - Department of Energy**

A federal agency of the United States of America.

**DOL - Department of Labor**

**DOP - Dioctyl Phthalate**

The traditional test aerosol used for determining HEPA filter efficiency was an aerosolized form of warm DOP, selected because, when generated in the specified manner, the aerosol had a very narrow size distribution.

**DOT - Department of Transportation**

**EAP - Emergency Action Plan**

A plan for a workplace, or parts thereof, describing what procedures the employer and employees must take to ensure employee safety from fire or other emergencies.

**EHS - Extremely Hazardous Substance; also Environmental Health and Safety**

**EHV - Extra High Voltage**

Voltage levels higher than 240,000 volts.

**EINECS – European Inventory of Existing Commercial Substances**

A list of chemicals available to the industrial market in Europe prior to Sept. 18, 1981. Each chemical was assigned an EINECS number.

**EMA - Emergency Management Agency**

**EMR - Electro-Magnetic Radiation**

Radiation caused by electromagnetism.

**EMS - Emergency Medical Service**

**EPA - Environmental Protection Agency**

**EPCRA - Emergency Planning and Community Right-to-Know Act**

Title III of SARA that requires facilities that store reportable quantities of hazardous materials to report to the LEPC.

**ERG - Emergency Response Guide**

A document that provides guidance on emergency response in a transportation incident involving chemicals.

**ERGO - Ergonomics**

**ERP - Emergency Response Plan**

A planned response effort by employees from outside the immediate release area or by other designated responders to an occurrence that results, or is likely to result, in an uncontrolled release of a hazardous substance.

**ERT - Emergency Response Team**

The team that is responsible for responding to an emergency.

**ESLI - End-of-Service-Life Indicator**

**f/cc - Fibers per cubic centimeter of air**

**FD & CA - Food, Drug, and Cosmetic Act**

**FEMA - Federal Emergency Management Agency**

An agency of the federal government.

**FID - Flame Ionization Detector**

**FIFRA - Federal Insecticide, Fungicide, and Rodenticide Act**

**FOIA - Freedom of Information Act**

**FOPS - Falling Object Protective Structure**

**FR - Federal Register**

A federal publication published each business day recounting all federal agency activity.

**Federal Records Center - American Federation of Labor and Congress of Industrial Organizations**

**GC - Gas Chromography**

**GSA - General Services Administration**

**HAWS - Hand-arm Vibration Syndrome**

**HAZCOM- Hazard Communication**

**HAZMAT - Hazardous Materials**

**HAZOP - Hazard and Operability (study)**

A structured means of evaluating a complex process to determine problems associated with its operability or safety.

**HAZWOPER - Hazardous Waste Operations and Emergency Response**

**HBV - Hepatitis B virus**

**HCP - Health Care Professional**

**HCR – Hazard Communication Rule**

Rule, found in 29 CFR 1910.1200, which resulted in the use of MSDSs, labeling, and employee training.

**HCS - Hazard Communication Standard**

A Federal standard requiring employers to communicate potential hazards to employees.

**HCV - Hepatitis C virus**

**HEPA - High Efficiency Particulate Air (filter)**

A filter that is at least 99.97% efficient in the filtration of air borne particles that are at least 0.3 microns in diameter.

**HFE - Human Factors Engineering**

**HFES - Human Factors and Ergonomics Society**

**HIV - Human Immunodeficiency Virus**

**HMIS - Hazardous Materials Identification System**

**HMTA - Hazardous Materials Transportation Act**

**HR - Hazard Ratio**

A term used in the NIOSH regulation (1996) on respirator certification.

**HPD - Hearing Protection Device**

**HSOs – Homeland Security Operations**



**IAQ - Indoor Air Quality**

The level of air quality inside of a building. Refers to situations where building occupants experience health and discomfort effects that appear to be linked to time spent in a building.

**IARC - International Agency for Research on Cancer****IBR - Incorporated By Reference**

A method of incorporating outside standards into the Code of Federal Regulations without having to restate them.

**ICS - Incident Command System**

Procedure for emergency management used by fire departments and other emergency response teams.

**IDLH - Immediately Dangerous to Life and Health**

As defined by NIOSH, this represents a maximum concentration from which one could escape within 30 minutes without any escape-impairing symptoms or any irreversible health effects. Note that the NIOSH definition addresses airborne concentration only. It does not consider direct contact with liquids, etc.

**IH – Industrial Hygienist****IIPP - Injury and Illness Prevention Program****ILO - International Labor Organization**

An international agency of the United Nations that addresses labor issues. Has an interest in occupational safety and health issues, and publishes useful reference materials.

**IOHS - International Occupational Hygiene Society****IR - Infrared****ISEA - Industrial Safety Equipment Association****ISO - International Organization for Standardization****JSA – Job Safety Analysis****LC-50 - Low Concentrate - 50%**

The concentration in air which is lethal to 50% of the test animals in a study.

**LD-50 - Lethal Dose - 50%**

The experimental dose that is lethal to 50% of the test animals in a study.

**LEL - Lower Explosive Limit**

The minimum percent by volume of a gas or vapor, that when mixed with air, will form a flammable mixture.

**LEPC - Local Emergency Planning Committee**

**LEV – Local Exhaust Ventilation**

A type of engineering control which encloses the process and remove dangerous fumes through air flow.

**LFL - Lower Flammable Limit**

**LOAEL - Lowest Observed Adverse Effect Level**

The lowest dose which produces an observable adverse effect.

**LOTO - Lock Out/Tag Out**

Procedures using an energy isolating device or a tag that alerts employees about the need for equipment to not be started.

**LPG - Liquid Propane Gas**

**LUST - Leaking Underground Storage Tank**

**MC - Methylene Chloride**

**MDA - 4,4' Methyleneedianiline**

**mg/kg – Milligrams per Kilogram**

A way of expressing dose: milligrams (mg) of a substance per kilogram (kg) of body weight.

**mg/m<sup>3</sup> – Milligrams per cubic meter**

A way of expressing the concentration of a substance in the air.

**ml - Milliliter**

A metric unit of volume. There are 1,000 milliliters in one liter. One teaspoon is equal to 5 milliliters.

**MRI - Magnetic Resonance Imagery**

**MSD - Musculoskeletal Disorders**

**MSDS - Material Safety Data Sheet**

Written or printed material concerning a hazardous chemical. It is prepared in accordance with 1910.1200.

**MSHA - Mine Safety and Health Administration**

An agency of the federal government.

**MWF - Metal-Working Fluids**

Fluids that are involved in procedures dealing with metal: Straight oil, soluble oil, semisynthetic oil, and synthetic oil.

**NADC - National Association of Demolition Contractors**

**NAICS - North American Industry Classification Standard**

**NAS - National Academy of Sciences**

**NATE - National Association of Tower Erectors**

**NCCI – National Council on Compensation Insurance**

**NCHS - National Center for Health Statistics**

**NEC – National Electric Code**

**NEMA - National Electrical Manufacturer's Association**

**NESHAP - National Emissions Standards for Hazardous Air Pollutants**

**NFPA - National Fire Protection Association**

**NHCA - National Hearing Conservation Association**

**NHIS-OHS - National Health Interview Survey**

**NHTSA - National Highway Traffic Safety Administration**

**NIEHS - National Institute of Environmental Health Sciences**

**NIH - National Institutes of Health**

**NIHL - Noise Induced Hearing Loss**

**NIOSH - National Institute of Occupational Safety and Health**

**NIST - National Institute of Standards and Technology**

A U. S. federal agency in the Department of Commerce. NIST is the successor to the US National Bureau of Standards.

**NOAEL - No Observed Adverse Effect Level**

**NPR - Notice of Proposed Rulemaking**

A step in the formal process of issuing regulations by US Agencies.

**NRC - Nuclear Regulatory Commission**

The US Federal Regulatory Agency which deals with radiation and radioactive materials.

**NRR - Noise Reduction Rating**

A rating given as a laboratory based indicator of the relative effectiveness of hearing protectors.

**NRTL - Nationally Recognized Testing Laboratory**

**NSC - National Safety Council (Congress)**

**NTP - National Toxicology Program**

A program of the US Government that tests chemical agents for long terms toxic effects.

**OAC – Ohio Administrative Code**

**OCOSH – Ohio Center for Occupational Safety and Health**

**OEMA – Ohio Emergency Management Agency**

**OMC - Office of Motor Carriers**

Federal agency that regulates motor carrier safety.

**OMB - Office of Management and Budget**

**ORM - Other Regulated Material**

Terms used in HAZMAT shipping. Expressed in terms of –A through –E indicating the type of hazard.

**OSH - Occupational Safety and Health (Act)**

**OSHA - Occupational Safety and Health Administration**

**OSHRC - Occupational Safety and Health Review Commission**

The branch of the federal government under the Department of Labor that oversees occupational safety and health litigation decisions.

**OVA - Organic Vapor Analyzer**

**OXY - Oxidizer**

**PAPR - Powered Air-Purified Respirator**

**PCB - Polychlorinated Biphenyl**

**PDS - Personnel Decontamination Station**

**PEL - Permissible Exposure Limits**

The maximum occupational exposure permitted under the OSHA regulations.

**pH – acidity or alkalinity**

A measure of how acid or caustic a substance is on a scale of 1 - 14

**PHA - Process Hazards Analysis**

A term describing the formal activity of reviewing, analyzing, and documenting the hazards likely to be associated with a particular industrial process.

**PHS – Public Health Service**

**PID - Photoionization Detector**

**PLHCP - Physician of Other Licensed Health Care Provider**

**PMA - Petition for Modification of the Abatement**

**PPB - Parts Per Billion**

Parts of a contaminant per billion parts of air or fluid.

**PPE - Personal Protective Equipment**

Equipment used to protect employees that they wear upon their person. Includes gloves, hard hats, respirators, shoes, etc.

**ppm- Parts Per Million**

Parts of a contaminant per million parts of air or fluid.

**psi – Pounds per Square Inch**

A measure of air pressure; at sea level the atmosphere exerts 14.7 psi.

**PSM - Process Safety Management**

A system for identifying and addressing safety-related hazards, including chemical hazards.

**PUBs – Public Information**

OSHA instructions published by the Directorate of Technical Support, provided as guidelines to Federal OSHA and Plan States compliance officers.

**PVC - Polyvinyl Chloride**

**QRA - Quantitative Risk Assessment**

Risk control procedures that can be quantified.

**RCRA - Resource Conservation and Recovery Act**

**REL - Recommended Exposure Limit**

A recommended exposure level for a particular agent or category of agents.

**RMA - Rubber Manufacturer's Association**

**RMI - Repetitive Motion Injuries**

Injuries caused by continued repetitive motions.

**RMP - Risk Management Plan**

A written program that is required by the Clean Air Act. It is designed to prevent accidental releases into the environment.

**ROM - Range Of Motion**

**ROPS - Rollover Protective Structure**

A structure designed to protect an occupant of a vehicle if it should roll over, such as a roll bar or a roll cage on a forklift.

**RPM - Revolution Per Minute**

**RR - Relative Risk**

**RSI - Repetitive Strain Injury**

Injury caused by repeated strains.

**RSPA - Research and Special Programs Administration**

An administration, under DOT, responsible for addressing transmodal issues relative to the safe, effective, and efficient transportation of people and goods throughout the world.

**RTECS - The Registry of Toxic Effects of Chemical Substances**

**RTK - Right-To-Know**

The right of employees to know about the nature and hazards of agents used in the work place, and/or to the right of communities and their members to know about materials used and wastes generated by workplaces situated within or adjacent to the community.

**RV - Residual Volume**

**S&H – Division of Safety and Hygiene**

**SAIC – Strategic Analysis and Information Center**

**SAR - Supplied Air Respirator**

A respirator that has a direct supply of breathable air.

**SARA - Superfund Amendments and Reauthorization Act**

A federal fund set aside to clean up existing hazardous waste sites.

**SCBA - Self-Contained Breathing Apparatus**

An atmosphere supplying respirator for which the breathing air source is designed to be carried by the user.

**SDS – Safety Data Sheet**

Term used in the EU to refer to a Material Safety Data Sheet (MSDS).

**SERC - State Emergency Response Committee****SHR - Standardized Hospitalization Ratio****SIC - Standard Industrial Classification****SOP - Standard Operating Procedure****STDs – Standards Directives**

Abstracts published by OSHA to provide guidance to OSHA personnel on a specific standard or standards.

**STEL - Short Term Exposure Limit****STPs – Federal Changes to State Programs**

Instructions published by OSHA describing a federal program change sent to the Regions and State designees.

**Ta - Ambient Air Temperature****TB - Tuberculosis**

An infectious disease caused by the tubercle bacillus and characterized by the formation of tubercles in various tissues of the body.

**TEDs – Training and Education Directives**

Directives published by OSHA which clarify processes and procedures for administering or monitoring OSHA regulations or processes.

**TLC - Total Lung Capacity****TLV - Threshold Limit Value**

An exposure limit recommended by the ACGIH. It is believed that, at this level, nearly all workers can be exposed day after day for a working lifetime without ill effect.

**TLV-C – Ceiling Exposure Limit**

The concentration of a substance in the air that should not be exceeded, even momentarily.

**TLV-Skin – Cutaneous Exposure Limit**

The skin designation refers to the potential contribution of the overall exposure by the cutaneous route.

**TLV-STEL - Threshold Limit Value—Short-term Exposure Limit**

**TLV-TWA – Threshold Limit Value-Time Weighted Average**

The allowable concentration for a normal 8-hour workday or 40-hour workweek.

**TSCA - Toxic Substance Control Act**

**TWA - Time Weighted Average**

**UBC - Uniform Building Code**

**UEL - Upper Explosive Limit**

**UFC - Uniform Fire Code**

**UFL - Upper Flammable Limit**

**ug - Microgram**

**UL - Underwriters Laboratories**

**USC - United States Code**

**USCG - U. S. Coast Guard**

**USPHS – United States Public Health Service**

**UST - Underground Storage Tank**

**UV - Ultra-Violet**

**VDT - Video Display Terminal**

**VOC - Volatile Organic Compound**

**VPP - Voluntary Protection Program**

An OSHA program that promotes excellence in workplace safety and health programs in exchange for limitations on scheduled inspections by OSHA.



**VSSR – Violation of a Specific Safety Requirement**

**WC – Workers' Compensation**

**WHMIS - Workplace Hazardous Materials Information System**

The Canadian workplace safety rule, WHMIS requires the creation and availability of material safety data sheets, warning labels on hazardous materials, and employee education and training.

**WMSD – Work-related Musculoskeletal Disorder**

## ACRONYMS

For the purposes of the NIMS, the following acronyms apply:

|          |  |
|----------|--|
| ALS      | Advanced Life Support                      |
| DOC      | Department Operations Center               |
| EMAC     | Emergency Management Assistance Compact    |
| EOC      | Emergency Operations Center                |
| EOP      | Emergency Operations Plan                  |
| FOG      | Field Operations Guide                     |
| GIS      | Geographic Information System              |
| HAZMAT   | Hazardous Material                         |
| HSPD-5   | Homeland Security Presidential Directive-5 |
| IAP      | Incident Action Plan                       |
| IC       | Incident Commander                         |
| ICP      | Incident Command Post                      |
| ICS      | Incident Command System                    |
| IC or UC | Incident Command or Unified Command        |
| IMT      | Incident Management Team                   |
| JIS      | Joint Information System                   |
| JIC      | Joint Information Center                   |
| LNO      | Liaison Officer                            |
| NDMS     | National Disaster Medical System           |
| NGO      | Nongovernmental Organization               |
| NIMS     | National Incident Management System        |
| NRP      | National Response Plan                     |
| POLREP   | Pollution Report                           |
| PIO      | Public Information Officer                 |
| PVO      | Private Voluntary Organizations            |
| R&D      | Research and Development                   |

|        |                                     |
|--------|-------------------------------------|
| RESTAT | Resources Status                    |
| ROSS   | Resource Ordering and Status System |
| SDO    | Standards Development Organizations |
| SITREP | Situation Report                    |
| SO     | Safety Officer                      |
| SOP    | Standard Operating Procedure        |
| UC     | Unified Command                     |
| US&R   | Urban Search and Rescue             |