DISASTER SITE WORKER

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Disaster Site Worker Overview

Background:

The construction trades played a critical role in the response to the World Trade Center (WTC) disaster. For months, ironworkers, operating engineers, laborers, truckers, and other skilled support personnel took part in response efforts. Based on lessons learned at the WTC disaster, it became clear that it was necessary to develop a training program for Disaster Site Workers who provide skilled support services, (e.g. utility, demolition, debris removal, or heavy equipment operation) or site clean-up services in response to natural and man-made disasters. Specifically, it was recognized that all workers at disaster sites need to be aware of the differences between disaster sites and regular construction or demolition work sites and be able to inspect, don, and doff air-purifying respirators.

The Disaster Site Worker Outreach Training Program meets a recognized training need:

- For workers who will provide skilled support or clean-up services at disaster sites.
- To raise awareness of management and labor that pre-incident training is essential for ensuring disaster site worker safety and health.

This program is intended to assist employers, workers, and others as they strive to improve workplace health and safety. It is not possible to include discussion of everything necessary to ensure a healthy and safe working environment in a course of this nature. Thus, this information must be understood as a tool for addressing disaster site workplace hazards, rather than an exhaustive statement of an employers legal obligations, which are defined by statute, regulations, and standards.

The Disaster Site Worker (DSW) Outreach Training Program:

Disaster Site Trainers are authorized to conduct the 15-hour, Disaster Site Worker Course (#7600), and receive "Course Cards" for their students. To become an authorized trainer, you must complete the Disaster Site Worker Train-the-Trainer Course (#5600). Trainers will be able to apply elements of successful adult training programs; acquire new knowledge, skills, and attitudes with regard to disaster site work; and demonstrate the ability to properly don, doff and inspect air-purifying respirators in order to accomplish successful delivery of the Disaster Site Worker Course.

Courses for Workers:

Disaster Site Worker #7600 (15-hours):

Emphasizes knowledge, precautions and personal protection essential to maintaining a workers personal safety and health at a disaster site. Includes modules on incident command, hazard recognition, traumatic incident stress, personal protective equipment and decontamination. Workers will perform an inspection of an appropriate air-purifying respirator, don the respirator and perform a user seal check, and doff the respirator.

Workers must complete the OSHA 10-hour Construction or General Industry Outreach Training Course or equivalent prior to attending this course. Training considered to be equivalent to this course is the OSHA 30-hour Construction or General Industry Outreach Training Course.

HAZWOPER Training Course (40-hour):

FOR CBRNE Events, Chemical and Oil Spills, and Radiological Disasters, HAZWOPER training is required for workers. This existing course offered by various sources. The course emphasizes specific knowledge and skills to safely remediate hazardous waste sites. Includes regulatory and technical knowledge as well as technical skill practice, including work practices to minimize risks and using engineering controls and protective equipment. This course must meet the training requirements of 29 CFR 1910.120/29 CFR 1926.65.

1] Introduction to Disaster Response

Disaster job sites differ from normal construction or demolition sites. Therefore, Disaster Site Workers roles and responsibilities on the job site are not the same either. Whether the disaster is natural or man-made, the on-site worker needs to develop an awareness of safety and health hazards that may be encountered. Enabling Disaster Site Workers to recognize that they have a responsibility to make decisions and choices that will positively affect their personal health/safety and that of others at the site is a primary theme of this 15-hour awareness course. Learners are given the opportunity to practice their new knowledge, skills and attitudes through discussion, planned exercises, demonstrations and presentations. The ability to immediately apply this new learning to their role as a disaster site worker is enhanced by participating in this interactive, instructor-led course.

Course Goal:

To provide Disaster Site Workers an awareness of the safety and health hazards they may encounter as well as of the importance of respiratory and other personal protective equipment and proper decontamination procedures that may be used to mitigate the hazards. Participants will support the use of an Incident Command System through the safe performance of their job responsibilities. They'll be able to show awareness of effects of traumatic incident stress that can result from working conditions and measures to reduce this stress. Of primary importance is the participants ability to perform the following specific tasks correctly:

- Inspection of an air-purifying respirator
- Donning and doffing an air-purifying respirator
- Respirator user seal check.

Course Enabling Objectives:

The "Disaster Site Worker Course" will enable the participant to:

- Recognize characteristics of a disaster site and their responsibility as a disaster site worker.
- Support the purpose and use of an Incident Command System
- Recognize disaster site health hazards
- Recognize disaster site safety hazards
- Recognize CBRNE agents and symptoms
- Show awareness of effects of and techniques for managing traumatic incident stress
- Recognize and demonstrate proper use of respiratory protection equipment
- Recognize proper use of other personal protective equipment
- Cite reasons for and simple methods of decontamination

This course is designed to provide disaster site workers with knowledge, information, and skills to work safely on disaster sites. Encourages participants to recognize and report hazards of assigned job tasks to ensure health and life safety.

Theme Worksheet:

Participants will complete a "Theme Worksheet" throughout the course as reinforcement of the learning. A discussion of their notes made to complete the "Theme Worksheet" will be facilitated at the end of the course to enhance the retention and transfer of their new knowledge back on the job.

What You Get from this Training:

- Knowledge and understanding about the hazards and life safety issues if you must respond to a disaster event
- Skill in recognizing hazards and evaluating risk
- Course card certifying your completion of this training

Employee Rights:

- Request information on hazards, precautions, and procedures
- Gain access to exposure and medical records
- Observe monitoring/measuring of hazardous materials and obtain the results
- Review injury and illness records
- See also OSHA publication 3021 "OSHA: Employee Workplace Rights"

Employee Responsibilities:

- Work cooperatively to reduce hazards
- Follow safety and health rules and regulations
- Wear or use prescribed PPE
- Report hazardous conditions
- Report job-related injury/illness & seek treatment promptly
- See also OSHA Publication 3021 "OSHA: Employee Workplace Rights"

Employer Responsibilities:

Employers have primary responsibility for health and safety of their employees during all phases of a response.

Employers must have safety and health procedures that protect their staff while responding to disasters. This includes providing training on specific hazards and providing Personal Protective Equipment that will adequately protect workers from in disaster situations in which they are working for the employer.

OSHA's Role at Disaster Sites:

OSHA's role will be guided by comprehensive national policies including the National Response Plan and specific response of the Incident Command System.

Terrorist Events:

OSHA may provide technical assistance rather than enforcement to ensure that employers take necessary actions to protect workers from hazards.

OSHA's Role at Disaster Sites:

Clean-up of Hazardous Materials Including CBRNE Agents OSHA can require HAZWOPER training.

Federal OSHA may require private sector employees; federal employees under executive order to have specialized training.

Individual States may require their own training in a Disaster or CBRNE event.

Volunteers:

OSHA does not have authority to regulate the activities of volunteers. However, OSHA's safety rules form a foundation for volunteers to build safety plans that educate their volunteers. This training in no way obligates volunteer organizations to follow OSHA standards or provide safety equipment for volunteers. This training will enables those who choose to volunteer to do so with the proper personal protective equipment and training to protects themselves and their teams during a disaster.

VOLUNTEERS ARE NOT EMPLOYEES of their Volunteer Organization unless they have been hired and are being paid for their activities.

Responder Categories

There are three basic types of responders at a disaster. Each plays a key role in helping communities respond and recover. All need direction, training, and safety measures to protect them.

Emergency Response Personnel:

- Fire
- Police
- Hazmat
- Search and Rescue
- Emergency Medical Services
- Skilled support personnel (DSW
- Volunteers

Disaster Site Workers (DSW):

- Volunteer or Paid
- Operating engineers
- Heavy equipment maintenance workers
- Truck loaders and drivers
- Riggers
- Torch cutters
- Iron workers
- Sheet metal workers
- Asbestos and lead abatement workers
- Decontamination workers
- Carpenters
- Laborers
- Utility workers
- Sanitation workers
- Structural engineers
- Coroner/Medical Examiner
- Animal Control
- Environmental Technicians (HAZWOPER)
- Safety and health (OSHA and Private Sector)
- Building Inspectors

Volunteers:

- Community Emergency Response Team (CERT)
- Light search and rescue
- Fire Suppression
- First Aid and Triage
- Shutting off utilities
- Assist in Evacuations

Hazard/Risk Analysis Definitions:

- Hazard:
  - Any substance, situation, or condition that is capable of causing harm
- Risk:
  - A measure of the probability and severity of a hazard to cause harm
- Safety:
  - Defined as a judgment of the acceptability of risk

Overall Risk of a local disaster:

Overall risk depends upon:

- Natural conditions that exist in the area
- The likelihood that a disaster event will occur or a terrorist will make an attempt to target a critical asset in your area depends on:
  - People
  - Property
  - The probability that the event or the attempt will be successful
  - The value of the assets lost

Construction Trades Involvement

Many in the construction trades are activated in a disaster. Though some of the work and hazards are similar to construction, many are not and need to be analyzed and mitigated by employers before sending workers into disaster work conditions.

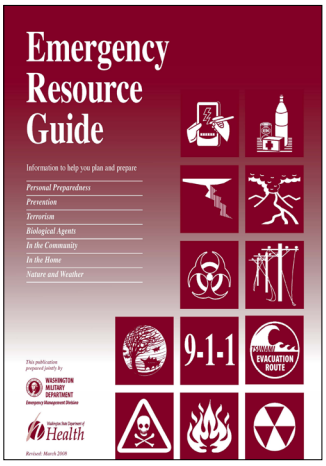
1] Types of Disasters

Types of Disasters

There are many different types of disasters that can effect a community, including natural disasters, technological or man made disasters or even terrorist events. For most citizens, no matter what the disaster there are basically two responses, shelter-in-place or evacuate. Thoughtful preparedness can make this choice easier on families and community leaders.

However, many listed on the previous page will neither be evacuating or sheltering. These will be responding to the disaster, which requires more specific knowledge of each type of event. With this knowledge they can protect themselves and help others recover from the event.

Natural Disasters:



- Avalanches
- Coastal Erosion
- Droughts
- Earthquakes (Page 37)
- Wildfires (Page 44)
- Floods (Page 40)
- Landslides (Page 41)
- Tsunamis & Seiches (Page 38)
- Volcanoes (Page 39)
- Extreme Heat (Page 42)
- Winter Storms (Page 46)
- Wind Storms (Page 45)
- West Nile Virus (Page 43)
- Tornadoes
- Hurricanes

Page numbers referenced are from Washington Emergency Management Division's "Emergency Resource Guide", a more in depth information of Washington Disasters. www.emd.wa.gov

Terrorism:

- Terrorism (CBRNE) (Page 17)
- Chemical (Page 20)
- Biological (Page 22-27)
- Radiological/Nuclear (Page 19)
- Explosive (Page 18)

Technological/Man Made Disasters:

- Dam Failures
- Fire Hazards
- Energy and Utility Outages
- Food and Water Contamination
- Hazardous Materials Releases
- Radiation Hazards
- Transportation Accidents
- Oil Spills
- Civil
- Disorder/ Riots
- Refugees
- Pandemic (Page 13)

A wave approaches Miyako City from the Heigawa estuary in Iwate Prefecture after the magnitude 9.0 earthquake struck the area March 11, 2011. Picture taken March 11, 2011. (REUTERS/Mainichi Shimbun)

People in a floating container are rescued from a building following an earthquake and tsunami in Miyagi Prefecture, northeastern Japan March 12, 2011. (REUTERS/Kyodo) #

2] DSW PPE - Preparedness

Disaster Site Workers have a primary responsibility of taking care of their families first. No worker can adequately concentrate on the rescue or disaster related tasks on hand if they are worried about their own families. Preparedness is the key. If your family is prepared with supplies, knows your plan and priorities and is emotionally equipped to take care of themselves while you volunteer, then you are good to go. If not, your own family could become victims of a disaster.

Take care of your family:

- (See Emergency Survival Kits)
- Food (2-3 Weeks)
- Water (2-3 Weeks)
- Shelter (tent)
- Make sure they are Emotionally Prepared for you to Volunteer or go to work at a Disaster

Take care of your Community:

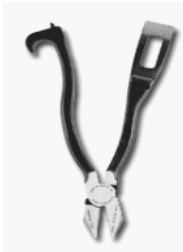
- Make a Plan for your Family
- Meeting Place for Evacuations
- Out of Area Contact for Family
- Special Considerations for Elderly/Infirm
- Group Plans for Your Neighborhood or Group

DSW "Go Bag:"

- I.D. - On you and pack
- Food/Water (3 Days)
- PPE
- Head Lamp/Flashlight
- Waterproof Matches/Candles
- Emergency Blanket
- Knife
- Water Purification
- 550 Cord
- Mini Folding Shovel
- Tube Tent
- Multi-tool
- Utility Shut Off Tool
- NOAA Radio
- Signal Mirror/Whistle
- Layered Clothing
- First Aid Kits
- Money in Small Bills
- Prescriptions

Basic Disaster/Rescue Supplies for Companies with Disaster Site Workers:

- Hammer
- Crow Bar
- Shovel
- Rescue Tool
- Personal Fall Arrest Harness
- Ropes and Rope Grab
- Anchor Straps
- Chain Saw
- Ax
- Shoring
- Decontamination Equipment



Minimum Response PPE for Disaster Site Workers/Volunteers: (Dry/Warm Weather)

- Hard Hat
- Safety Glasses/Goggles
- Ear Protection
- Hi-Visibility Clothes or Vests
- Gloves
- Boots
- Personal Fall Arrest Harness
- Dust Mask or 1/2 Mask Respirator

Minimum Response PPE for Disaster Site Workers/Volunteers: (Wet, Floods)

- Hard Hat
- Safety Glasses/Goggles
- Ear Protection
- Hi-Visibility Rain Gear
- Gloves
- Rubber Boots
- Hip Waders
- ½ Mask Respirator
- Life Jacket

Additional Response PPE for Disaster Site Workers/Volunteers:

- Tyvek Disposable Clothing (Class C)
- Full Face Respirator and Cartridges
- Decontamination Shower

EMERGENCY SURVIVAL KITS FOR HOME OR WORK

Government agencies will respond to community disasters, but citizens may be on their own for hours, even days, after disaster strikes. You should be prepared to take care of yourself and your family for at least three days. In some emergencies, such as an influenza pandemic, you may need to prepare for a week or more.

Emergency Survival Kit:

Store a kit at home, at work and at each child's school or day care facility.

- Dry or canned food and drinking water for each person
- Can opener
- First aid supplies and first aid book
- Copies of important documents, such as birth certificates, licenses and insurance policies
- "Special needs" items for family members, such as infant formula, eyeglasses and medications
- A change of clothing
- Sleeping bag or blanket
- Battery powered radio or television
- Flashlight and extra batteries
- Whistle
- Waterproof matches
- Toys, books, puzzles, games
- Extra house keys and car keys
- List of contact names and phone numbers
- Food, water and supplies for pets

Additional items you can store at home for use during an emergency:

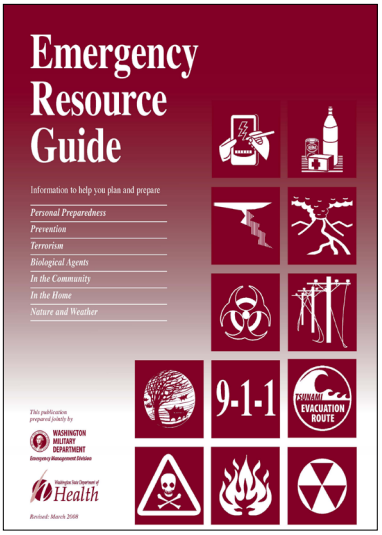
- Cooking supplies
- Barbecue, camp stove
- Fuel for cooking, such as charcoal or camp stove fuel
- Plastic knives, forks, spoons
- Paper plates and cups
- Paper towels
- Heavy-duty aluminum foil

Sanitation Supplies:

- Large plastic trash bags for trash and protection from water
- Large trash cans
- Bar soap and liquid detergent
- Shampoo
- Toothpaste and toothbrushes
- Feminine and infant supplies
- Toilet paper
- Household bleach with no additives, and eyedropper (for purifying drinking water)
- Newspaper — to wrap garbage and waste

Comfort:

- Sturdy shoes
- Gloves for clearing debris
- Tent



Tools:

- Ax, shovel, broom
- Crescent wrench for turning off gas
- Screwdriver, pliers, hammer
- Coil of one-half inch rope
- Plastic tape and sheeting
- Knife or razor blades
- Garden hose for siphoning and fire fighting

Shelter-in-Place Supplies:

- Plastic
- Grey tape
- Box cutter knives

SHELTER IN PLACE:

Whether you are at home, work or elsewhere, there may be situations when it's simply best to stay where you are and avoid any uncertainty outside.

There may be circumstances when staying put and creating a barrier between yourself and potentially contaminated air outside, a process known as "sealing the room," is a matter of survival. An example would be a train wreck where a chemical accident occurs.

Use common sense and available information to assess the situation and determine if there is immediate danger. If you see large amounts of debris in the air, or if local authorities say the air is badly contaminated, you may want to take this kind of action.

The process used to seal the room is considered a temporary protective measure to create a barrier between you and potentially contaminated air outside. It is a type of sheltering in place that requires preplanning.

- Bring your family and pets inside.
- Lock doors, close windows, air vents and fireplace dampers.
- Turn off fans, air conditioning and forced air heating systems.
- Take your emergency supply kit unless you have reason to believe it has been contaminated.
- Go into an interior room with few windows, if possible.
- Seal all windows, doors and air vents with 2-4 mil. thick plastic sheeting and duct tape. Consider measuring and cutting the sheeting in advance to save time.
- Cut the plastic sheeting several inches wider than the openings and label each sheet.
- Duct tape plastic at corners first and then tape down all edges.
- Be prepared to improvise and use what you have on hand to seal gaps so that you create a barrier between yourself and any contamination.
- Local authorities may not immediately be able to provide information on what is happening and what you should do. However, you should watch TV, listen to the radio or check the Internet often for official news and instructions as they become available.

3] Incident Command System

The Incident Command System (ICS) is "a systematic tool used for the command, control, and coordination of emergency response" according to the United States Federal Highway Administration.

An ICS is based upon a flexible, scalable response organization providing a common framework within which people can work together effectively.

ICS includes procedures to select and form temporary management hierarchies to control funds, personnel, facilities, equipment, and communications. Personnel are assigned according to established standards and procedures previously sanctioned by participating authorities. ICS is a system designed to be used or applied from the time an incident occurs until the requirement for management and operations no longer exist.

History:

ICS was originally developed in the 1970s during massive wildfire suppression efforts in California and following a series of catastrophic wildfires in California's urban interface.

Property damage ran into the millions, and many people died or were injured. Studies determined that response problems often related to communication and management deficiencies rather than lack of resources or failure of tactics.

Following the terrorist attack of 9-11, the Department of Homeland Security began development of at National Incident Management System (NIMS) that will be uniform across the nation. The federal government will provide assistance to state and local governments to develop all-hazards plans and ensure that state, local, and federal plans are compatible.

Unity of Command:

Each individual participating in the operation reports to only one supervisor. This eliminates the potential for individuals to receive conflicting orders from a variety of supervisors, thus increasing accountability, preventing freelancing, improving the flow of information, helping with the coordination of operational efforts, and enhancing operational safety. This concept is fundamental to the ICS chain of command structure.

Common Terminology:

An incident command system promotes the use of a common terminology and has an associated glossary of terms that help bring consistency to position titles, the description of resources and how they can be organized, the type and names of incident facilities, and a host of other subjects. The use of common terminology is most evident in the titles of command roles, such as Incident Commander, Safety Officer or Operations Section Chief.

Management by Objective:

Incidents are managed by aiming towards specific objectives. Objectives are ranked by priority, should be as specific as possible, must be attainable and if possible given a working time-frame. Incident objectives are used to ensure that everyone within the ICS organization has a clear understanding of what needs to be accomplished.

Incident objectives are established based on the following priorities:

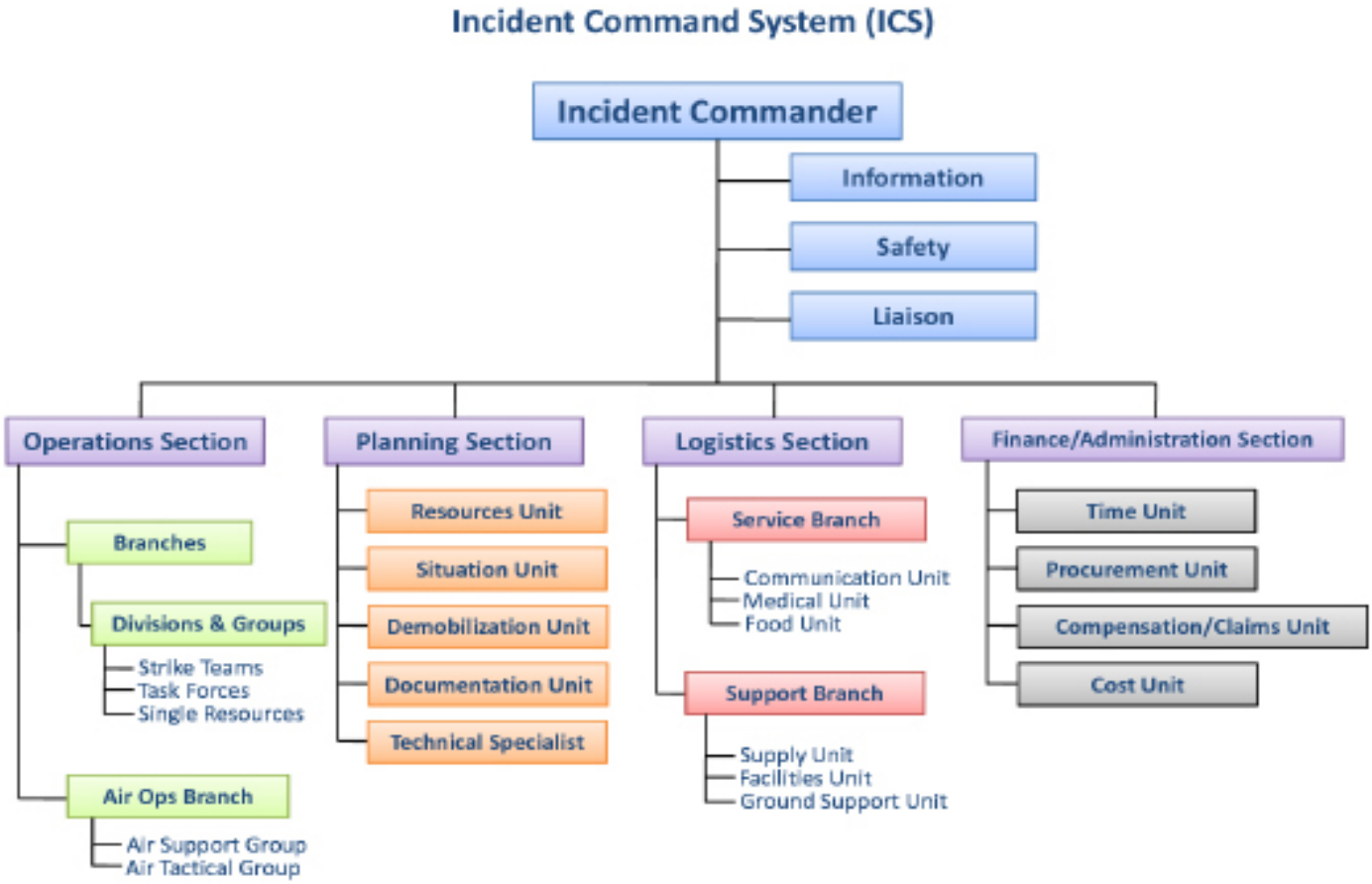
1. **Life Safety**
2. **Incident Stabilization**
3. **Property/Environmental Preservation**

Flexible and Modular Organization:

Incident Command structure is organized in such a way as to expand and contract as needed by the incident scope, resources and hazards. Command is established in a top-down fashion, with the most important and authoritative positions established first. For example, Incident Command is established by the first arriving unit.

Only positions that are required at the time should be established. In most cases, very few positions within the command structure will need to be activated.

Only in the largest and most complex operations would the full ICS organization be staffed. Conversely, as an incident scales down, roles will be merged back up the tree until there is just the IC role remaining.



Communications/Information Management

Incident communications are facilitated through the development and use of a common communications plan and interoperable communications processes and architectures.

Information and Intelligence Management: The incident management organization must establish a process for gathering, sharing, and managing incident-related information and intelligence.

Span of Control:

To limit the number of responsibilities and resources being managed by any individual, the ICS requires that any single person's span of control should be between three and seven individuals, with five being ideal. In other words, one manager should have no more than seven people working under them at any given time. If more than 7 resources are being managed by an individual, a new command position should be instituted. If fewer than three, then the position's authority can probably be absorbed by the next highest rung in the chain of command.

Incident Commander:

Single Incident Commander - Most incidents involve a single incident commander. In these incidents, a single person commands the incident response and is the decision-making final authority.

Unified Command - A Unified Command is used on larger incidents usually when multiple agencies are involved. A Unified Command typically includes a command representative from major involved agencies and one from that group to act as the spokesman, though not designated as an Incident Commander. A Unified Command acts as a single entity.

Area Command - During multiple-incident situations, an Area Command may be established to provide for Incident Commanders at separate locations. Generally, an Area Commander will be assigned - a single person - and the Area Command will operate as a logistical and administrative support. Area Commands usually do not include an Operations function.

Command Transfer:

A role of responsibility can be transferred during an incident for several reasons: As the incident grows a more qualified person is required to take over as Incident Commander to handle the ever-growing needs of the incident, or in reverse where as an incident reduces in size command can be passed down to a less qualified person (but still qualified to run the now-smaller incident) to free up highly-qualified resources for other tasks or incidents. Other reasons to transfer command include jurisdictional change if the incident moves locations or area of responsibility, or normal turnover of personnel due to extended incidents. The transfer of command process always includes a transfer of command briefing, which may be oral, written, or a combination of both.

Command Staff:

Safety Officer - The Safety Officer monitors safety conditions and develops measures for assuring the safety of all assigned personnel.

Public Information Officer - The Public Information Officer serves as the conduit for information to internal and external stakeholders, including the media or other organizations seeking information directly from the incident or event.

Liaison Officer - A Liaison serves as the primary contact for supporting agencies assisting at an incident.

General Staff:

Operations Section Chief - The Operations Section Chief is tasked with directing all actions to meet the incident objectives.

Planning Section Chief - The Planning Section Chief is tasked with the collection and display of incident information, primarily consisting of the status of all resources and overall status of the incident.

Finance/Administration Section Chief - The Finance/Admin. Section Chief is tasked with tracking incident related costs, personnel records, requisitions, and administrating procurement contracts required by Logistics.

Logistics Section Chief - The Logistics Section Chief is tasked with providing all resources, services, and support required by the incident.

Branch (Director) -ICS organizational level having functional responsibility for major segments of incident operation. The Branch level is organizationally situated between Section and Groups in Operations and Section and Units in Logistics.

Division (Supervisor) - A Division is a unit arranged by geography, along jurisdictional lines if necessary, and not based on the makeup of the resources within the Division.

Group (Supervisor) - A Group is a unit arranged for a purpose, along agency lines if necessary, or based on the makeup of the resources within the Group.

Unit, Team, or Force (Leader) - Such as "Communications Unit," "Medical Strike Team," or a "Reconnaissance Task Force."

A Strike Team - Composed of same resources (four ambulances, for instance)

A Task Force - Composed of different types of resources (one ambulance, two fire trucks, and a police car, for instance).

Individual Resource - This is the smallest level within ICS and usually refers to a single person or piece of equipment. It can refer to a piece of equipment and operator,.

Facilities:

ICS uses a standard set of facility nomenclature. ICS facilities include: Pre-Designated Incident Facilities: Response operations can form a complex structure that must be held together by response personnel working at different and often widely separate incident facilities. These facilities can include:

Incident Command Post (ICP): The ICP is the location where the Incident Commander operates during response operations. There is only one ICP for each incident or event, but it may change locations during the event. Every incident or event must have some form of an ICP.

Staging Area: Can be a location at or near an incident scene where tactical response resources are stored while they await assignment.

Base

B

On a map, the base appears as a circle with a B in it.

Base: is the location from which primary logistics and administrative functions are coordinated and administered. The resources in the Base are always out-of-service.

Camp, Helibase & Helispot

C

H

H-3

Staging Areas: are where personnel and equipment are gathered while waiting to be assigned.

Camps: Locations, often temporary, within the general incident area that are equipped and staffed to provide sleeping, food, water, sanitation, and other services to response personnel.

Helibase: is the location from which helicopter-centered air operations are conducted.

Helispots: are more temporary locations at the incident, where helicopters can safely land and take off.

Each facility has unique location, space, equipment, materials, and supplies requirements that are often difficult to address, particularly at the outset of response operations. For this reason, responders should identify, pre-designate and pre-plan the layout of these facilities, whenever possible.

On large or multi-level incidents, higher-level support facilities may be activated. These could include:

- **Joint Information Center (JIC)**
- **Emergency Operations Center (EOC)**

Multiple Agency Coordination Center (MACC): Also known as an Emergency Operations Center, the MACC is a central command and control facility responsible for the strategic, or "big picture" of the disaster.

Role/Responsibilities of Disaster Site Worker:

1. Respond to notification of need for special expertise
2. Do not respond unless requested; do not freelance or operate outside of Command Structure
3. Report to staging area/check-in /credentials
4. Receive training on PPE and safe work practices, including decontamination procedures, that is specific to the disaster work site.
5. Obtain briefings from assigned contact person
6. Comply with crime scene requirements (if applicable) and other directives
7. Perform assigned tasks
8. Decontaminate as applicable

Function:	Description:
Incident Command	• Establishes incident objective, strategies and priorities. • Assume overall responsibility for the incident.
Operations	• Determines tactics and resources for achieving objectives. • Directs the tactical response.
Planning	• Collects and analyzes information. • Tracks resources. • Maintains documentation.
Logistics	• Provides resources and needed services.
Finance/Administration	• Accounts for expenditures, claims and compensation. • Procures needed resources.

NIMS: The National Incident Management System (NIMS) provides standard command and management structures that apply to response. This common system enables responders from different jurisdictions and disciplines to work together to respond to incidents.

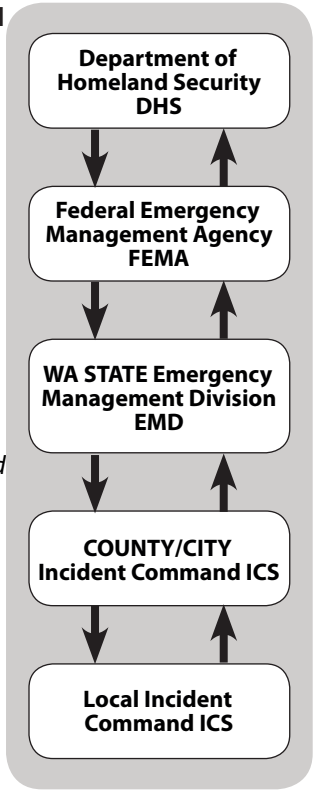
NIMS provides a core set of common concepts, principles, terminology, and technologies such as the Incident Command System (ICS). Much of NIMS is built upon ICS, which was developed by the Federal, State, and local wildland fire agencies during the 1970s. ICS is normally structured to facilitate activities in five major functional areas: command, operations, planning, logistics, and finance/administration. In some circumstances, intelligence and investigations may be added as a sixth functional area.

NRF: The National Response Framework (NRF) presents the guiding principles that enable all response partners to prepare for and provide a unified national response to disasters and emergencies. It establishes a comprehensive, national, all-hazards approach to domestic incident response. The National Response Plan was replaced by the National Response Framework effective March 22, 2008.

The National Response Framework defines the principles, roles, and structures that organize how the United States responds as a nation.

ESFs: Emergency Support Functions. (ESFs) The Federal Government and many State governments organize much of their resources and capabilities – as well as those of certain private-sector and nongovernmental organizations – under 15 Emergency Support Functions (ESFs). ESFs align categories of resources and provide strategic objectives for their use. Following is an abbreviated list and primary agency associated with the ESF.

- **ESF #1 – Transportation:** Department of Transportation (DOT) *Aviation/airspace management and control, Transportation safety, Restoration/recovery of transportation infrastructure, Movement restrictions, Damage and impact assessment*
- **ESF #2 – Communications:** Department of Homeland Security (DHS): *Coordination with telecommunications and information technology industries, Restoration and repair of telecommunications infrastructure.*
- **ESF #3 – Public Works and Engineering:** Department of Defense/U.S. Army Corps of Engineers (DOD/USACE) *Infrastructure protection and emergency repair.*
- **ESF #4 – Firefighting**: Department of Agriculture/Forest Service (USDA) *Coordination of Federal fire fighting activities; Support to wildland, rural, and urban fire fighting operations*
- **ESF #5 – Emergency Management:** Department of Homeland Security/Federal Emergency Management Agency (DHS/FEMA) *Coordination of incident management and response efforts, Issuance of mission assignments, Resource and human capital, Incident action planning, Financial management*
- **ESF #6 – Mass Care, Emergency Assistance, Housing, and Human Services:** (DHS/FEMA) *Mass care, Emergency assistance, Disaster housing, Human services*
- **ESF #7 – Logistics Management and Resource Support:** (DHS/FEMA) *Comprehensive, national incident logistics planning, management, and sustenance capability, Resources.*
- **ESF #8 – Public Health and Medical Services:** Department of Health and Human Services (HHS)*Public health, Medical, Mental health services, Mass fatality management*
- **ESF #9 – Search and Rescue:** (DHS/FEMA) *Life-saving assistance, Search and rescue operations*
- **ESF #10 – Oil and Hazardous Materials Response:** Environmental Protection Agency (EPA) *Environmental short- and long-term cleanup*
- **ESF #11 – Agriculture and Natural Resources:** (USDA) *Nutrition assistance; Animal and plant disease and pest response; Food safety and security*
- **ESF #12 – Energy:** Department of Energy (DOE) *Energy infrastructure assessment, repair, and restoration; Energy industry utilities coordination; Energy forecast*
- **ESF #13 – Public Safety & Security:** Department of Justice (DOJ) *Facility and resource security; Security planning and technical Support to access, traffic, and crowd control*
- **ESF #14 – Long-Term Community Recovery:** (DHS/FEMA) *Social and economic community impact assessment and community recovery assistance.*
- **ESF #15 – External Affairs:** (DHS) *Emergency public information and protective action guidance; Media and community relations.*



The ESFs are activated as necessary in a disaster to coordinate response through an Emergency Operation Center.

For more information see http://www.emd.wa.gov/ for Washington State Resources and the Emergency Operations Center at Camp Murray. For national or general information see http://www.fema.gov/emergency/nims/index.shtm

4] Safety Hazards

Injuries to Rescue Workers and DSW's Often Come From:

- Secondary collapse in structures,
- Falls into below grade spaces and voids,
- Explosions from ruptured flammable gas containers or lines,
- Asphyxiation in closed/confined spaces,
- Electrocution from unrecognized live power sources,
- Equipment or vehicle accidents,
- Drowning while attempting a rescue,
- And basic construction related injuries.

Training which causes workers to be alert and recognize these hazards is the first step to protecting DSWs. A series of conditions, along with their predictable hazards and precautions to avoid injury will be discussed in this section.

Disaster Site Workers often work along side Emergency Services to help out with rescue and recovery operations. Taking time to plan the rescue will significantly reduce the risk of injury to workers.

REMEMBER: AN UNPLANNED RESCUE WILL PROBABLY BE YOUR LAST.

Unstable Structures:

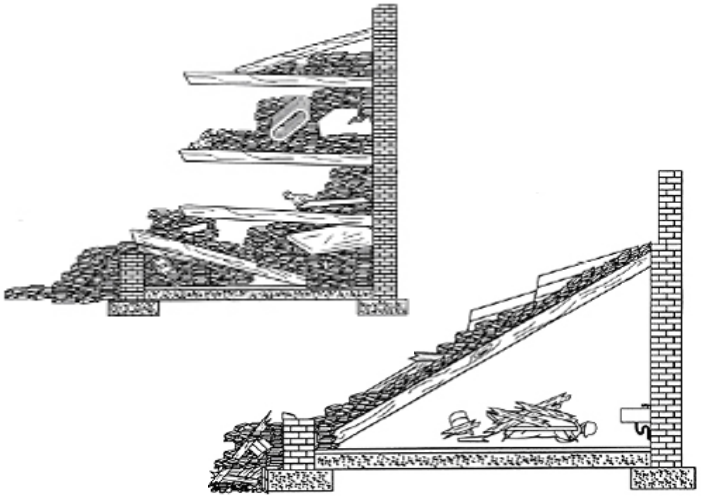
Hazard recognition:

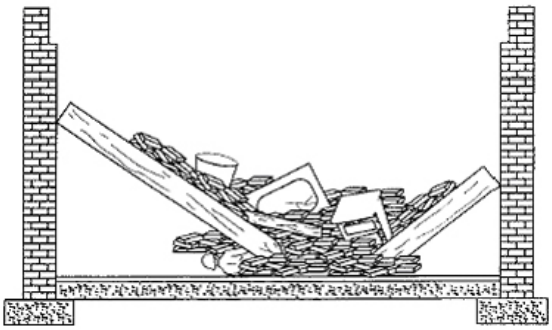
- Cantilever
- Lean to
- V-shape
- Pancake

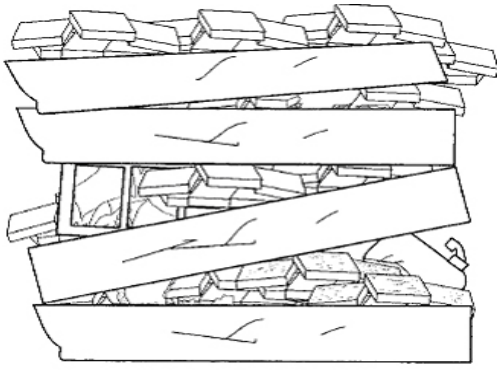
Hazards of removing structural supports — Fallen debris which has created a natural support for other structures

Precautions/Actions to Take to Avoid Injury:

- Identify potential secondary collapses
- Use the "Buddy System"
- Notification procedures during rescues/investigation
- Shoring systems that have been put in place to prevent structural failure
- Personal protective equipment necessary includes Personal Fall Arrest (PFA) harness and anchors straps available
- Establish a limited access zone that runs the entire length of the wall and equals the height of the wall plus four (4) feet.
- The limited access zone applies to the side of the wall opposite the piece of debris to be lifted; this will eliminate the risk of a disaster site worker of being struck.
- Brace the free standing wall in a manner that would prevent it from collapsing.
- Utilize tag lines on the piece of debris which is to be lifted so as to prevent it from swinging into the free standing wall.







BELOW GRADE SPACES AND VOIDS:

- Hazard recognition
- Trenches/excavation
- Basements
- Underground parking garage
- Elevator shafts

Precautions/actions to take to avoid injury

- Identify potential void areas in buildings, probe when possible
- "Buddy System"
- Notification procedures during rescues/investigation
- Personal protective equipment necessary includes Personal Fall Arrest (PFA) harness and tie off straps available while above ground

CONFINED SPACES

Hazard Recognition:

- Oxygen Deficient Atmospheres
- Over 50% of the workers who die in confined/enclosed spaces are attempting to rescue other workers.

Precautions/actions to take to avoid injury for Confined/Enclosed Spaces Below Grade

OSHA 1910.146 Confined Space Training

DO NOT ENTER CONFINED SPACE WITHOUT PROPER EQUIPMENT AND TRAINING -

OVER 50% OF DEATHS IN CONFINED SPACE ARE RESCUERS.

IF TRAINED:

- Ventilate and monitor for hazardous conditions
- Lock out or tag out all power equipment in the space
- Issue appropriate PPE, possibly including self-contained breathing apparatus (SCBA)
- Establish barriers to external traffic such as vehicles and pedestrians
- Provide ladders or similar equipment for safe entry and exit in the space
- Provide good communications equipment and alarm systems
- Have rescue equipment nearby

FLAMMABLES, COMBUSTIBLES, AND COMPRESSED GASES:

Hazard Recognition:

- a hissing, roaring or blowing sound
- dirt being blown into the air
- water being blown into the air at a pond, river or creek
- continuous bubbling in wet, flooded areas
- fire at or near exposed piping
- flames apparently emanating from the ground
- dead or brown vegetation in an otherwise moist or green field

Presence of hazardous materials:

- Those that are present before the disaster occurred
- The materials that workers bring to a disaster clean up job

Precautions/actions to avoid injury:

- Proper storage/use of compressed gas cylinders
- Using electrical sensing devices
- Use gas sensing devices
- Avoid working by Severed utilities
- Look out for severed communications
- Fire Extinguishers
- Shut off utilities where possible

Electrocution Hazards:

Hazard Recognition

- Overhead power lines
- Underground power lines
- Energized electrical transportation systems
- Temporary wiring
- Generators
- Portable tools and equipment
  - Flexible cords

(extension cords)

Precautions/Actions to Avoid Injury

- Maintain at least a 10' distance to all power lines
- Using electrical sensing devices
- Treat all power sources as "live" until determined otherwise
- Ground-fault circuit interrupter protection
- Shuffle feet when leaving possibly charged object or area

Heavy Equipment/Vehicles:

Hazard Recognition

- supporting surfaces for equipment may fail
- assembly and disassembly of lattice boom cranes
- Swing radius
- Roll over potential
- Exposure to exhaust pipes
- Vehicles with limited rear view
- Vehicle lights and other warnings
- Equipment cab glass considerations
- Blind Spots
- Traffic
- Washout and Sinkholes

Precautions/Actions to Avoid Injury:

- Proper selection, set-up, use and maintenance of traffic control devices
- Flagger qualifications/proper techniques
- Establishing worker-free zones
- Swing Radius marked and clear of workers
- Minimize the need to back up equipment
- Seat Belts

Floodwater:

Hazard Recognition

- Swift Water
- Capacity of Boats
- Standing Water
- Jagged Edges
- Contaminated Water

Precautions/Actions to Avoid Injury

- Stay out of the water whenever possi
- Appropriate PPE
- Not driving through water
- Coast Guard Approved Life Jacket
- Rescue equipment
- Never work alone

Chain Saw Injuries:

Hazard Recognition

- Kick back
- Falling on running chain saw
- The two most common places for injuries are the front left thigh and the back of the left hand.

Precautions/Actions to Avoid Injury

- The engine should be shut off when not in use
- The chain brake should be engaged
- The scabbard is covering the guide bar to prevent cuts
- The chain saw is carried backward
- The muffler is carried away from the body to prevent burns
- NEVER cut with the tip of the chain saw!
- Lock your front elbow
- Be careful not to cut through nails or knots in the wood
- Stand to the side
- Use a low kickback chain
- Use a chain brake

Slip And Fall Injuries:

Hazard recognition

- Debris and rubble piles
- Exposed rebar and other impalement hazards
- Working at Heights

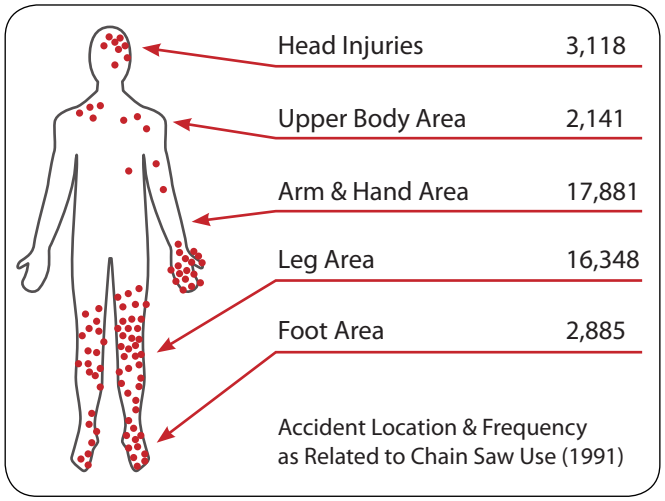
Precautions/actions to avoid injury

- Guardrail systems
- Toe boards/screens
- Controlled/limited access zones
- Personal fall arrest systems
- Crane suspended baskets

General Training Required For DSWs:

Hazards encountered in disasters are not completely unknown or unpredictable. Employers are required to anticipate hazards workers will be exposed to in the course of their work and provide proper training and PPE to work under those conditions. The following is a general list of OSHA and WAC standards your employees should receive training on BEFORE you send them out in disaster or emergency conditions.

- Heavy Construction Equipment (1926.600 thru 605,1926.251)
- Fall Protection (1926.102 sub-part M)
- Demolition (1926 sub-part T)
- Material Handling (1910.178 and 1926.250)
- Electrical Safety (NFPA, NEC, and 1910.332)
- Fire Safety (1926.24,.150 and .151, 1910.39, .157)
- Hand and Power Tools (1910.242, 1926.300-.305)
- Illumination (1926 sub-part C)
- Scaffold safety addressed in (1926 Sub-part L)
- Ladder use shall conform to (1926 Sub-part X)



Two welders work to free up portions of the wreckage of the World Trade Center at ground zero in New York Thursday, Sept. 27, 2001. (AP Photo/Elise Amendola)

All Safety Hazards Precautions:

Be aware of possible hazards and accept that you could become a victim (get the needed training)

Wear PPE Including:

- Hard Hat
- Safety Glasses/Goggles
- Ear Protection
- Hi Visibility Clothes or Vests
- Gloves
- Boots
- Dust Mask or Respirator
- Personal Fall Arrest Harness
- Life Jacket

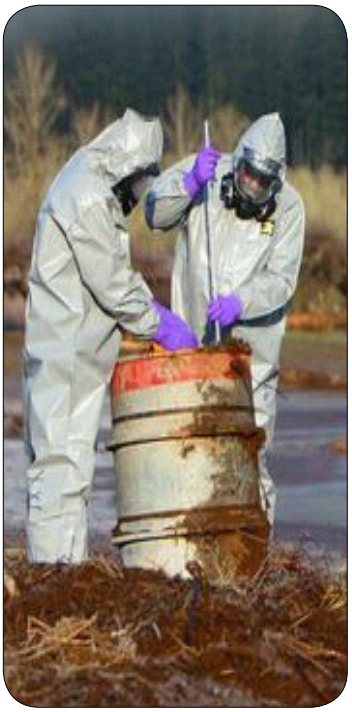
Plan your Rescues/Inspections

Do not attempt any rescue or recovery without proper equipment and training

Always Use the "Buddy System"

5] Health Hazards

Workers on a disaster site can be exposed to a number of hazards that can cause short or long term health hazards. Recognizing these hazards and using proper PPE often becomes the individual responsibility of the Disaster Site Worker. The OSHA 10 curriculum you attended should have given you an overview of Hazard Communication and chemical properties, and your First Aid training should give you a more in depth look at blood borne pathogens, animal and plant hazards, and heat and cold stress.



- Chemical Exposure
- Hot work
- Dusts and Noise
- Heat and cold stress
- Diseases/Pandemic Flu
- Blood borne pathogens,
- Animals/Plant Hazards

Chemical Exposure:

Routes of Exposure

In order for a chemical to cause injury, it must enter the body

1. Inhalation is breathing-in a hazardous material. It may damage the lungs, and it may be absorbed in the blood and carried to other parts of the body. Inhalation is the most common route of entry. Any airborne substance can be inhaled.
2. Skin or eye contact is when a hazardous material gets on your skin or in your eye.
3. Skin absorption is when a hazardous material gets on your skin and soaks through. It enters the blood and is carried to other parts of the body.
4. Ingestion is when you accidentally swallow a material. This might happen, for example, if the material gets on your hands, and then on the sandwich you eat for lunch.
5. Injection is when a sharp object punctures the skin, allowing a chemical or infectious agent to enter.

1. Inhalation

Hazard Recognition

Lungs are extremely vulnerable to chemical agents

Substances that do not directly affect the lungs can pass through lung tissue to blood stream

Often the most common routes of entry for a chemical to enter a person's body on a waste site

Target Organs:
LUNGS (respiratory system)

- Irritants (ammonia)
- Fibrotic agents (silica or asbestos)
- Mutagens (lead)

Precautions/Actions to Avoid Injury

Respiratory Protection

- 1/2 Mask
- Full Face
- PAPR
- SCBA

2. Skin or Eye Contact

Hazard Recognition

- Splashing chemicals
- Caustic materials
- Burns
- Dusts

Precautions/Actions to Avoid Injury

- Safety Glasses
- Safety Goggles
- Face Shields

3. Absorption Through the Skin

Hazard Recognition

- Vapors
- Chemicals

Enhanced by:

- Abrasions
- Cuts
- Heat
- Moisture

Precautions/Actions to Avoid Injury

- Gloves
- Chemical Resistant Gloves
- Chemical Protective Suits

4. Ingestion

Hazard Recognition

- Dusts, chemicals and vapors that might settle on food
- Personal habits such as chewing gum or tobacco
- Drinking
- Eating
- Smoking

Precautions/Actions to Avoid Injury

- Wash Hands before eating
- Do not eat, drink, or smoke in
- Contaminated Areas

5. Injection

Hazard Recognition

- Chemicals introduced into the body through a puncture wound

Examples:

- Stepping
- Falling
- Tripping onto contaminated objects

Precautions/Actions to Avoid Injury

- Heavy duty work gloves
- Sharps containers
- Fall protection

Chemical Exposure can be generally divided into two categories:

Acute Exposures and acute effects generally involve short-term, high concentrations, and immediate or prompt health effects (illness, irritation, or death).

The concentration required to produce such effects varies widely from chemical to chemical, and person to person.

Chronic Exposure refers to exposure continued or repeated for a prolonged period, usually years. Chronic exposure may cause a substance to be continuously present in the tissues.

It may take many years between the time you were exposed and when symptoms begin to appear. This is called the latency period. For some diseases, like cancer, the latency period can be twenty, thirty or more years.

Categories of Toxic Chemicals

Asphyxiates: chemicals that deprive the body tissue of oxygen – chemically interfering with the body's ability to transport and use 02 during respiration

Carcinogens: category of chemicals are known to cause cancer in humans or in lab test animals

Irritants: group of chemicals that will irritate various tissues causing redness, rashes, swelling, coughing or even hemorrhaging

Sensitizers: allergen. These chemicals cause allergic like reactions due to sensitivity from prior exposure (ethylene oxide, benzene)

Mutagens: these chemicals will cause alterations in a person's DNA. Mutagenic damage can be passed on to children

Teratogen: these chemicals can cause damage or death to developing fetus. This damage cannot be passed on to further generations and do not effect the genetic code. dioxins, lead)

Chemical Reactions Cause All Routes Of Exposure:

- Ignition of explosive or flammable chemicals
- Oxygen enrichment
- Agitation of shock or friction sensitive compounds
- Sudden release or materials under pressure

States Of Matter/Dusts:

Hazards
All states of matter pose some threat if a hazardous substance enters the body. Below are listed 7 states of matter. We will focus on number 7, Dusts and its hazards and precautions rescue workers should take.

1. **FUMES:** when a material from a volatilized SOLID condenses in cool air. Welding, brazing and metallizing operations involving molten metals produce fumes
2. **SMOKE**: consists of carbon or soot and results from incomplete combustion of materials
3. **AEROSOLS:** liquid or solid particles that are fine enough in size to remain dispersed in air for a prolonged period of time
4. **MISTS**: a finely divided liquid suspended in the atmosphere
5. **GASES:** formless fluids that expand to occupy the space or enclosure in which they are confined
6. **VAPORS:** substances that are normally a solid or liquid at room temperature and pressure. Evaporation is the process by which a liquid is changed into a vapor state.
7. **DUSTS**: solid particles generated by handling, crushing, grinding, rapid impact, breaking apart by heat of inorganic and organic materials such as wood, rock, metal, coal, ore and grain caustic cement / concrete dust, respirable crystalline silica, asbestos and lead.

Precautions/Actions to Avoid Injury
Engineering Controls
- Ventilation
- Containment

Administration Controls
- Reduce Exposure Time
- Air Monitoring

Work Practices that reduce Dust
- Wet
- Vacuum

PPE such as:
- Respiratory Protection
- Disposable Clothing
- Hazmat Suits

Hot Work:

Hazards
Many welding, cutting, and similar processes produce fumes and gases, which may be harmful to your health. Welding "smoke" is a mixture of very fine particles (fumes) and gases. Many of the substances in welding smoke, such as chromium, nickel, arsenic, asbestos, manganese, silica, beryllium, cadmium, nitrogen oxides, phosgene, fluorine compounds, carbon monoxide, cobalt, copper, lead, ozone, selenium, and zinc can be extremely toxic.

Generally, welding fumes and gases come from:
- the base material being welded or the filler material that is used
- coatings and paints on the metal being welded, or coatings covering the electrode
- shielding gases supplied from cylinders
- chemical reactions which result by the action of ultraviolet light from the arc, and heat
- process and consumables used
- contaminants in the air

The health effects of welding exposures are difficult to list, because the fumes may contain so many different substances that are known to be harmful (depending on the factors listed above). This is particularly true for welding operations conducted at disaster sites. The individual components of welding smoke can affect just about any part of the body, including the lungs, heart, kidneys, and central nervous system.

Precautions/Actions to Avoid Injury

- Welding Respirators
- Welding Hoods
- Flame Retardant Clothing

NOISE: (CFR 1910.95)

Hazards

- Workers being distracted
- Physical damage to the ear, pain, temporary and/ or permanent damage
- Communication interference
- Hearing Loss

Conductive Loss (Chronic Exposure):

- Low frequency loss (outer & middle ear)
- Occurs from ear plugs, wax, disease, hole in ear

Sensorineural Loss:

- High frequency loss (inner ear)
- Birth defect, noise damage, disease . . . etc.

Mixed Loss

- Conductive and sensorineural loss
- Noise-Induced Hearing Loss vs. Acoustic Trauma

Occupational noise-induced hearing loss:

- Result of exposure to continuous or intermittent loud noise
- Hearing loss develops slowly over a long period

Occupational acoustic trauma

- Sudden change in hearing as a result of a single exposure to a sudden burst of sound, such as an explosive blast

Precautions/Actions to Avoid Injury

- Hearing Protection
- Reduce time around Loud Noises

Terms:

dBA = decibels/unit of measurement on A scale

90 dBA = feasible administrative or engineering controls

85 dBA = hearing conservation program

TWA = time weighted average (8 hrs)

HEAT STRESS:

Hazards

- The same PPE that shield the body from chemical exposure also limit the dissipation of body heat and moisture
- Depending on the ambient conditions, and work load, heat stress can occur within as little as 15 minutes

Heat Stroke is the most serious Heat Stress Disorder

HEAT STROKE = MEDICAL EMERGENCY

Precautions/Actions to Avoid Injury

- Drink Water frequently
- Have rest periods and cool down
- Avoid sugary drinks and alcohol
- Avoid working in the direct sun where possible

COLD STRESS:

Hazards

HYPOTHERMIA IS A MEDICAL EMERGENCY!

Severe body heat loss-body temp falls below 95° F

- Frostbite
- Painful or frozen extremities

Occurs when:

- Conditions are windy, clothing is wet, and/or the individual is inactive
- Extended water exposure or immersion
- 1 hour or less when water temp is below 45° F
- Prolonged exposure in slightly cool water, thunderstorms, hail, rain and accompanying winds

Precautions/Actions to Avoid Injury

- Provide warming shelters/areas
- Wear layers of clothing
- Keep socks and clothing dry
- Drink hot fluids and eat often
- Keep active

Bloodborne, Waterborne, And Insect Or Animal Pathogens:

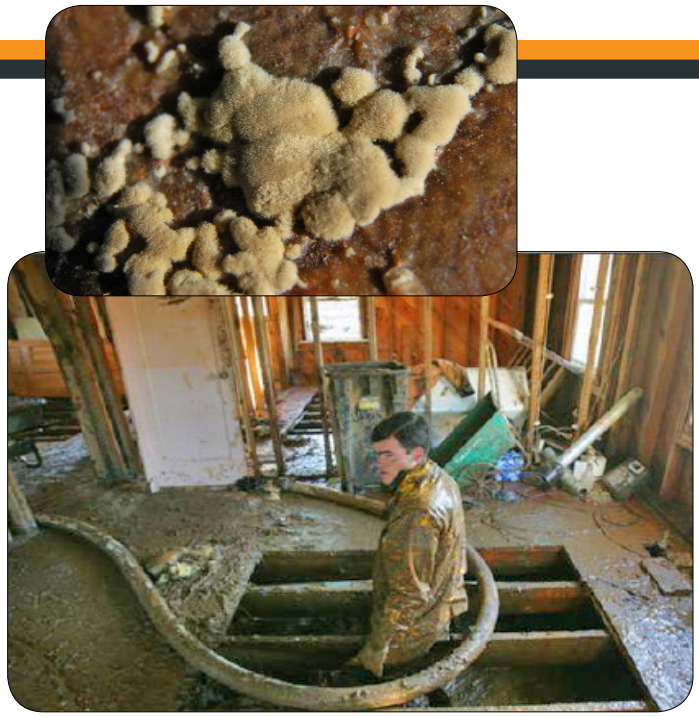
Hazards

- Exposure to body fluids (HIV, HBV)
- Exposure to dead bodies
- Exposure to flood water (Infections)
- Exposure to animals and insects (Hanta Virus)

Precautions/Actions to Avoid Injury

- Use universal precautions when dealing with body fluids, including gloves, face shields and masks
- Wear special chemical resistant outer clothing and protective goggles when working in contaminated water
- Decrease the risk of mosquito and other insect bites by wearing long-sleeved shirts, long pants, and by using insect repellents.
- Wash your hands with soap and water that has been boiled or disinfected before preparing or eating foods, after using the bathroom, after participating in flood cleanup activities, and after handling articles contaminated by floodwater.
- Before working in flooded areas, be sure that your tetanus shot is current (given within the last 10 years). Wounds that are associated with a flood should be evaluated for risk; a physician may recommend a tetanus immunization.

Flood photos in this document are from The Chronicle, Lewis County WA



Mold:

Hazards

- Sight – They usually appear as distinctly colored woolly mats (e.g., mildew is black and is one of the most common molds in a household).
- Smell – They often produce a foul odor, such as a musty, earthy smell.

Precautions/Actions to Avoid Injury

- Make sure the working area is well ventilated. Place mold damaged materials in a plastic bag and discard.
- Clean mold off hard surfaces and other nonporous materials with detergent and water, and dry completely.
- Disinfect these cleaned surfaces with one of the following household bleach solutions:
- 1/4 cup household bleach per 1 gallon of clean water or light contamination.
- 1-1/2 cups household bleach per 1 gallon of clean water for heavy contamination.

CAUTION: Do not mix bleach with other cleaning products that contain ammonia. Highly toxic chlorine gas can be produced.

- Avoid breathing mold spores. A P-100 filter on a full face respirator is recommended.

- Avoid getting mold spores in your eyes. Goggles without ventilation holes are recommended.
- Avoid touching mold with your bare hands. Long gloves that extend to the middle of the forearm are recommended. Use ordinary household rubber gloves when cleaning surfaces with water, bleach, and a mild detergent. Gloves made from natural rubber, neoprene, nitrile, polyurethane, or PVC are recommended if using a disinfectant, biocide, or strong cleaning solution.

AIR MONITORING:

Airborne contaminants can present a significant threat to worker and surrounding community health & safety. Well prepared companies with Disaster Site Workers will have metering capability for their employees. This is often the same equipment used for confined spaces, lead or asbestos work, carbon monoxide monitoring and similar construction and demolition work.

Measurement of airborne contaminants is useful in:

- PPE selection
- Delineating areas where protection is needed
- Assessing potential exposure above PEL
- Determine necessity for medical monitoring Measurement Methods
- Direct Reading Instruments

WHEN AIR MONITORING IS NOT AVAILABLE, ASSUME HAZARDOUS CONDITIONS EXIST.

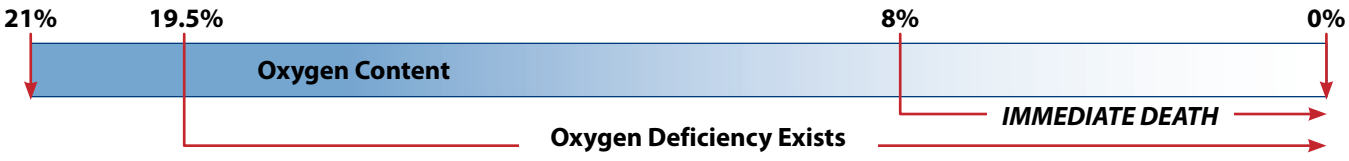
- Laboratory Analysis
  Direct-Reading Instruments
- Developed for early warning of exposure
- Some can detect down to 1 ppm
- Provide real time sampling data
  Multi-gas Meters
- All Gas Detectors has many Multi-Gas Meters that provide single and multiple gas monitoring options for oxygen, Carbon monoxide, hydrogen sulfide, and combustibles
- Commonly used in Permit Required Confined Space Entry Procedures Oxygen Monitor
- Measures oxygen levels
- Less than 19.5% is...
- Greater than 23.5% is...

Uses and Limitations of Direct Reading Instruments:

- Help select PPE
- Determine further monitoring needs
- Chemical-specific
- May give false readings
- Weather conditions may affect accuracy
- Levels of contamination may change (continuous monitoring may be required)

Laboratory Analysis Limitations:

- May take a long time to get results
- Site conditions change
- Can be expensive
- Laboratory Analysis is not that realistic in a disaster situation



PANDEMIC FLU: Simple Steps to Protect Yourself and Your Community

Taking Protective Actions during a Flu Pandemic

A flu pandemic is an outbreak caused by a new flu virus that spreads around the world. The virus will spread easily from person to person, mostly through coughing and sneezing. Because the virus is new to people, everyone will be at risk of getting it.

Symptoms of Flu

All types of flu can cause:

- Fever or feeling feverish/chills
- Coughing and/or sore throat
- Runny or stuffy nose
- Headaches and/or body aches
- Chills
- Fatigue
- Some people may have vomiting and diarrhea, though this is more common in children than adults.

* It's important to note that not everyone with flu will have a fever.

Protect Yourself and Others:

- Wash your hands often with soap and water. Use an alcohol-based hand cleaner if soap and water are not available.
- Cover your mouth and nose with a tissue or your arm when you cough and sneeze.
- Stay away from other people if you are ill.
- Avoid crowded places and large gatherings as much as possible.
- There may be times during a pandemic when you must be in a crowded setting or in close contact (within 6 feet) with people who might be ill. During such times, the use of a facemask or a respirator might help prevent the spread of pandemic flu.

Consider wearing a facemask if

- You are sick with the flu and think you might have close contact with other people.
- You live with someone who has the flu (you therefore might be in the early stages of infection) and need to be in a crowded place. Limit the amount of time you spend in these crowded places and wear a facemask while you are there.
- You are well and do not expect to be in close contact with a sick person but need to be in a crowded place. Limit the amount of time you spend in these crowded places and wear a facemask while you are there.

Consider wearing a respirator if

- You are well and you expect to be in close contact with people who are known or thought to be sick with pandemic flu. Limit the amount of time you are in close contact with these people and wear a respirator during this time. These recommendations apply if you must take care of a sick person at home.

Protect your Company

Change your company policy to include pandemic flu preparation and encourage employees to stay home if they are sick. This may involve a 'culture shift' for many companies who discourage using sick leave for even legitimate reasons. The change could save lives.

DO NOT GO OUT IF YOU'RE SICK, SEND SICK PEOPLE HOME. QUARANTINE IS NECESSARY.

Adapted from http://www.cdc.gov/flu/pandemic/

Excerpts from CDC Website

6] CBRNE

Since the disaster of September 11, 2001, and the acts of terrorism around the world that have followed, fear of the use of CBRNE agents by terrorists as weapons-of-mass-destruction (WMD) has been at an extremely high level. The use of chemical, biological, and explosive agents is not new. Incidents involving these agents can be found throughout history. Terrorism involving chemical and biological agents can range from putting deadly substances in the nation's food supply to the release of a nerve gas in an attack on a subway system. Explosive incidents of a terrorist nature, whether domestic or international, make the news almost nightly. The possibility of a radiological dispersal device, or "dirty bomb," is widely discussed.

Introduction to Types of Agents Used for Weapons of Mass Destruction

- **C.** Chemical;
- **B.** Biological;
- **R.** Radiological;
- **N.** Nuclear; and
- **E.** Explosives (includes incendiaries)

Examples Include:

Chemical: sarin gas; mustard; ammonia
Biological: anthrax; smallpox; botulism toxin
Radiological: dirty bombs; tritium gas
Nuclear: nuclear bombs
Explosives: Improvised Explosive Devices (IED), TNT; dynamite

Terrorists are likely to use criteria to determine the best agent to use for terrorism. Likely criteria employed by terrorist will include:

- Destructive potential of an agent;
- Material availability of an agent or to build an agent;
- Ease of deployment; or
- Technology required to build, detonate or disperse an agent.

Locations to be aware of potential CBRNE Events

- Government Buildings
- Public Transportation
- Public Events or Assemblies
- Religious Assemblies

Most Common Toxic Industrial Chemicals (TICs) Involved in Accidents

1. Ammonia
2. Chlorine
3. Hydrogen fluoride
4. Flammable mixture
5. Chlorine dioxide
6. Propane
7. Sulfur dioxide
8. Hydrogen chloride
9. Hydrogen
10. Methane
11. Butane
12. Ethylene oxide
13. Hydrogen sulfide
14. Formaldehyde
15. Isobutane
16. Pentane
17. Titanium tetrachloride
18. Phosgene
19. Nitric acid
20. Ethane
21. Oleum
22. Ethylene
23. Vinyl chloride
24. Trichlorosilane
25. Methyl chloride

Source: Chemical accident risks in U.S. industry – A preliminary analysis of accident risk data from U.S. hazardous chemical facilities. USEPA.

Chemical Agents

States of Matter
- Solid
- Liquid
- Gas
- Combination

Routes of Entry
- Inhalation
- Ingestion
- Skin absorption
- Injection
- Combination

Industrial Chemicals

Chemical hazards can arise from a plant accident or a deliberate release, the effects are similar on the public.. Many chemicals are readily available in large quantities, which makes them usable as weapons of mass destruction. But whether the release is deliberate or not, responders must be aware of the dangers. See the box above listing the most common toxic industrial chemicals.

Military Chemical Warfare Agents

Particularly since World War I, chemical agents have been developed and used in warfare and on civilian populations. There are several types of chemical agents and their basic effects are outlined as follows:

Choking Agents:

Choking agents may be a from a deliberate release of an industrial chemical on a population. Large tanker trucks, 55 gallon drums, or other tanks may be reported in an unusual area. Victims may report odors such as chlorine, bleach or swimming pool odors (chlorine) and for Phosgene, the odor of newly mown hay or grass.

Outward signs and symptoms include:

- tearing
- burning of eyes
- chest tightness
- difficulty breathing

Treatment

Removing the victims as soon as possible from the gents and getting them decontaminated is first step for victims. However, there is no anti-dote or specific treatment for those exposed to choking agents

Victims of the Union Carbide chemical leak in Bhopal, India, wearing patches over their eyes, December 1984. AFP/Getty Images

Nerve Agents

Nerve agents effect the Central Nervous System and are very deadly without an antidote. Many of the these agents were developed by German scientists during World War II and have military designations starting with G and are marked in parenthesis after each name. V agent (VX) was developed by the British, but is 100 times more lethal and can remain in an area for weeks after released. Nerve agents can be dispersed as a liquid, vapor, or gas and so responders should be aware of explosions that only seem to destroy the package, unusual odors, or unusual death of animals in an area. Types of nerve agents include:

- Soman (GD)
- Sarin (GB)
- Tabun (GB)
- V agent (VX)

Signs and Symptoms of Nerve Agent Exposure

A mass casualty incident with no obvious trauma could indicate a nerve agent event. Pinpoint pupils (meiosis) are the best indications of nerve agent use. Though most of the following symptoms will also present.

- S = Salivation
- L = Lacrimation (tearing)
- U = Urination
- D = Defecation
- G = Gastrointestinal (GI) Distress (cramps)
- E = Emesis (vomiting)
- M = Muscle Twitching ("bag of worms")

Treatment

If available, the military has a stock of nerve agent antidote called Mark I or Duodote, an anti-nerve agent auto-injector. Multiple doses are needed to save the lives of those exposed.

Blister Agents

Common blister agents (vesicants) include Sulfur Mustard (H), Phosgene Oxime (CX) and Lewisite (L). A garlic odor followed by irritation to the eyes or respiratory system could indicate a blister agent attack. Again, small explosions that seam to cause little damage, unusual spraying or dispersal of a liquid, gas, or vapor would result in suspicion of a blister agent release. Blister agents effect the moist areas of the body, but primarily damage the respiratory system and skin. Signs and Symptoms include:

- Skin irritation, burning
- formation of large blisters
- swollen or closed eyes
- severe cough

Treatment
Removing the victims as soon as possible from the gents and getting them decontaminated is first step for victims. There are no civilian treatments available for most blister agents. Burn centers may be best equipped to attempt treatment on these victims.

Blood Agents

Agents that effect the blood's ability to carry oxygen are called blood agents or metabolic agents. These agents kill quickly, in less than minutes. Blood agents can be formed from hydrogen cyanide (AC), cyanogen chloride (CK) and basic pesticides. Dispersed as a gas, some of these agents have an almond odor. These agents are commercially produced in large quantities. Sign and symptoms include:

- gasping for air
- dizziness
- altered mental status
- coma
- seizures
- sudden death

Treatment
Removing the victims as soon as possible from the gents and getting them decontaminated is first step for victims. However, there is no anti-dote or specific treatment for those exposed to blood agents. Medical facilities will attempt to oxygenate and ventilate the victims if received in time.

Irritating Agents

The general intent of most choking or irritating agents is to incapacitate a crowd. Tear gas, mace, and pepper spray are commonly used by military or police for this purpose. A peppery odor in the air or on victims would indicate use of one of these agents. Other odors such as hair spray for tear gas and apple blossoms for mace have been used to describe the agents. Signs and symptoms include:

- tearing
- difficulty breathing, coughing,
- choking
- nausea and vomiting

Treatment
Removing the victims as soon as possible from the gents and getting them decontaminated and to medical care.

Biological Weapons:

The deliberate use of disease-spreading microorganisms, toxins, or viruses constitutes a biological weapon. Because it may take days or weeks for signs and symptoms of a biological weapon to appear, the health care community may first notice with a huge intake of patients with similar signs and symptoms. At times, a terrorist group may warn or take credit for a release of a biological weapon before victims show symptoms. There are few other detection methods available.

Types off Biological Weapons

- Bacteria
- Pathogens- Viruses
- Toxins

Bacterial toxins - poisonous non-living substances produced through the metabolic activities of living organisms.

Pathogens - Infectious microorganisms that cause disease in man, animals and plants.

Toxins- Toxic substances of natural origin produced by an animal, plant, or microbe.

Routes of Entry

- Inhalation
- Ingestion
- Skin absorption
- Injection
- Combination

Biological Agents -Bacteria:

Cholera - Bacteria: Direct or indirect fecal contamination of water or food

- Incubation: 4 hrs - 5 days
- Infectious dose: 10 - 500 organisms
- Vomiting, headache, intestinal cramping, voluminous diarrhea

- Death if untreated: 50%, low with treatment
- Treatment: fluid and electrolyte replacement plus antibiotics
- Vaccine: 50% protection, booster every 6 months

Anthrax - Bacteria: Cutaneous, inhalation, and gastrointestinal disease.

- Infectious dose: 8,000-10,000 spores•
- Incubation: 1-6 days
- Fever, malaise, fatigue, cough and mild chest discomfort
- Death if untreated: 25% Cutaneous,
- 100% Inhalation
- Treatment: high dose antibiotic
- Vaccine – 18 month period

Plague - Bacteria: Bubonic, Primary Septicemia, and Pneumonic

- Infective dose: <100 organisms
- Incubation: 2 - 10 days
- High fever, chills, headache
- Death: untreated 50% bubonic, 100% pneumonic
- Treatment: antibiotics
- Vaccine available

Biological Agents - Viruses

Viruses: Organisms that reproduce inside living cells

- Smallpox
- Viral hemorrhagic fevers

Smallpox - Virus: Communicable from person to person

- Infective dose: 10 - 100 organisms
- Incubation: 7 - 17 days
- Fever, rigors, vomiting, headache, backache, lesions
- Death: 3% vaccinated - 30% non vaccinated
- Treatment: supportive
- Vaccine: Vaccinia Immune Globulin (VIG), 3 - 5 yrs

Hemorrhagic Fever - Virus: Mosquitoes, ticks, inhale contaminated dust

- Infective dose: 1 - 10 organisms
- Incubation: 4 – 21 days
- Easy bleeding, flushing of face, vomiting, diarrhea

Anthrax exposure after 1 and then 7 days

- Death: varies from 5% to 90%
- Treatment: supportive care
- Vaccine: only for Yellow Fever

Hemorrhagic Fever - Viruses:

- Marburg Virus
- Ebola Virus
- Rift Valley
- yellow fever

Hemorrhagic Fever

Biological Agents - Toxins

Toxins: poisonous, non-living, substances produced through the metabolic activities of living organisms

- Ricin
- Botulinum

Ricin - Toxin: Plant protein toxin (castor bean).

- Infective dose: 3 - 5 µg/kg
- Incubation: 18 - 24 hours
- Fever, cough, pulmonary edema, severe respiratory distress, severe gastrointestinal pain
- Treatment: supportive
- Vaccine: none

Botulism - Toxin: Plant protein toxin (castor bean).

- Infective dose: varies
- Incubation: varies
- voluntary muscle control diminishes, paralysis from head and face down, eventual respiratory arrest from paralysis
- Treatment: ventilatory support

How To Protect Yourself From Biological/Chemical Agents:

Respiratory: Full Face Respirator with a CBRN filter, preferably Supplied Air or SCBA

PPE: Skin Covering (Level C Suit Minimum)

Decontamination:
- Wash with soapy water
- Rinse
- Decontaminate with 0.5% bleach solution
- Rinse

Summary: Medical conditions resulting from Biological exposure may be a delayed reaction from actual exposure event.|
Level A Chemical Protective Suits are required to deal with Biological and often Chemical agents. Even at a great distance, wear a CBRN Respirator and Cartridges if there is a possible CBRNE event.

Radiation:

People are continually exposed to radiation in different forms, such as naturally occurring background radiation or x-rays for medical purposes.

Radiation is energy. The amount and type we are exposed to can cause serious health effects, even death. Knowing more about radiation can help protect us in a Radiological or nuclear emergency.

Radiation will pass right through you. You can't see, taste, or feel radiation. Contamination is material that is attached to radiation emitting elements and can spread (i.e. water or dust).

Catastrophic Events that may cause Radiation include nuclear reactor accidents, nuclear submarine events, nuclear bombs being detonated, a 'dirty bomb' explosion in a populated area.

Hazards

A nuclear accident, explosive laced with radioactive material (dirty bomb), or nuclear device could cause an explosion that releases radiological materials into the environment. If we are close to the source, we may be exposed to the radiation by absorption, inhalation of contaminated dust, water or we might ingest food that has radioactive particles in it.

Ionizing Radiation: Radiation of sufficient energy to alter the atomic structure of materials or cells with which it interacts, including electromagnetic radiation is called ionizing radiation.

Acute Effects: Acute means short term effects from an exposure. Following are a list of acute effects from radiation exposure, also called Acute Radiation Sickness:

- Skin burns
- Vomiting
- Diarrhea
- Unconsciousness
- Hair loss
- Death

Chemical Protective Suits for CBRNE events: Level A - Vapor Protective Suit with SCBA enclosed. Level B- Liquid Protective Suit and SCBA on outside of suit. (Separate hands on training required before wearing Level A and B suits/SCBAs) Level C- Tyvek or Liquid Protective Suit and Air Purifying Respirator and Cartridges. Level D Protection is never adequate for CBRNE events.

Chronic Effects: Chronic means long term health effects from an exposure. Following are a list of chronic effects from radiation exposure:

- Delayed tumors
- Birth defects
- Cancers
- Changes in blood chemistry
- Factors Affecting Biological Damage

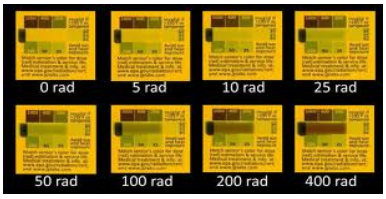
The quantity of radiation, length of exposure, type of radiation, and body part exposed all may effect the long term outcomes of radiation exposure. The age, gender, and general health of the victim are also factors.

Radiological Agents Detection

Radiation cannot be detected by human senses, you must use Electronic or other instruments

- Geiger Counters
- Dosimeters
- RadStickers

Effects of Radiation: In general terms, one measure of radiation exposure is the Roentgen Equivalent Man (REM)



(1 REM=1 RAD of Beta, Gamma, X-ray).
A dose greater than 100 rem can make you get Acute Radiation Sickness and also damages function of cell. The cells can be permanently changed and divide abnormally, which may cause cancers.
Exposure of a dose greater than 100 REMs may damage DNA.

> 100 rems fully-body exposure diarrhea, nausea, and weakness occur

> 300 rems full-body exposure, the immune system is damaged

> 1000 rems full-body exposure, circulatory system fails, causing death

The effects of radiation exposure are cumulative.

Your exposure should be measured by a device that show your on-going exposure like a dosimeter or RADSticker.®

The longer you are exposed, the more damage radiation does to you.

Ionizing Radiation

Radiation of sufficient energy to alter the atomic structure of materials or cells with which it interacts, including electromagnetic radiation. This type causes long term damage like cancer and birth defects. There are three common types of ionizing radiation.

- Alpha particles - can use PPE for protection
- Beta particles - some PPE may work
- Gamma rays - concrete and lead shielding and distance only protection

How to Protect Yourself from Radiation Exposure:

Keep exposure to the minimum, though the term ***ALARA*** is used because 'no exposure' is probably not an option.

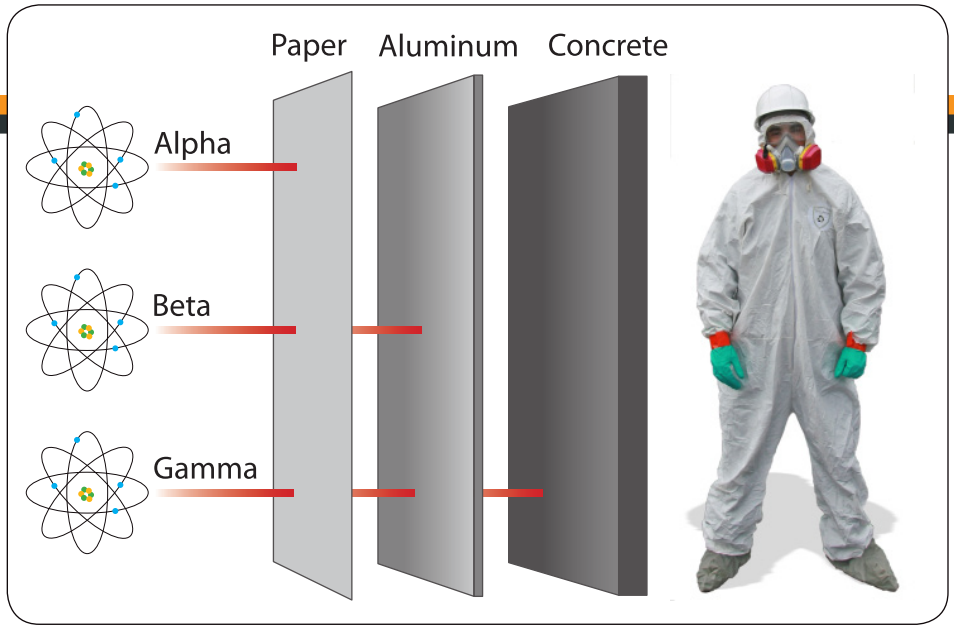
A = As
L = Low
A = As
R = Reasonably
A = Achievable

Time: Don't expose yourself unless there is an overall benefit. Reduce time spent near radiation source.

Distance: Stay as far away from the source as possible, evacuating as soon as the authorities allow you to do so.

Shielding: Place shielding material between you and the source. Alpha radiation can be shielded by a anti-contamination class C suit (Anti-C) and respirator. However, Beta and Gamma radiation need much thicker shielding and no current technology is available at a personal protective suit level.

Decontamination: Can remove the majority of radiation from fallout or dust contamination on skin



and clothes.

How Dirty Bomb Works:
Uses gas expansion to propel radioactive material over wide area.

When explosive goes off radioactive material spreads in a "dust cloud".

Carried by the wind, radioactive material it reaches a wider area than the explosive itself.

Public Health Emergency: A radiation event causes fear and civil unrest, which often leads to more emergencies. There may be many with injuries or sudden illness. Special decontamination methods may be needed.

Many will fear the long term health effects and need comfort.

Explosives:

Explosive Device:

The initiation produces a sudden expansion of the material usually accompanied by the production of heat and large changes in pressure (and typically also a flash and/or loud noise) which is called the explosion.

Incendiary Devices:

Incendiary devices are designed to start fires or destroy sensitive equipment using materials such as napalm, thermite, chlorine trifluoride, or white phosphorus.

Routes of Entry: Injuries from explosive can be caused by Injection from shrapnel, trauma from change in pressure, inhalation injuries from incendiary fires or explosions or burns.

Types of Devices:
- IED (Improvised Explosive Devices)
- Satchel/Suitcase Bomb
- Letter Bomb
- Vehicle Bomb
- Pipe Bomb
- Suicide Bomber
- Small charge explosive

Weapons of Mass Destruction (WMD) Dispersal Devices:
- Containers
- Can/Jar
- Pressurized cylinder
- Explosives
- Mechanical systems of buildings

Secondary Devices:

Many terrorist groups plant secondary devices to wound or kill responders and increase press coverage. The most famous example of this was the second plane into the Twin Towers in New York on September 11, 2001. Responders must be alert when at a known terrorist event that a secondary device may be present. Workers and responders should look for obvious devices with timers, booster charges, or blasting caps. They should also be alert to strong chemical odors or bulk chemicals present with no apparent reason. Often, a simple backpack left in public may be an explosive device.

Summary:

Little can be done to mitigate explosion injuries or fatalities by workers or responders. However, being aware and reporting suspicious packages or bags may prevent an explosion. Keeping a safe distance from the explosion site to avoid secondary devices is also recommended.

7] Traumatic Incident Stress

Disaster site workers should prepare themselves for their role during and following a disaster by learning about the possible impact of disaster on them and others, emotionally and physically. This knowledge will help Disaster site workers understand and manage their reactions to the event and to work better with others.

Almost all individuals will experience a crisis and even a traumatic event in the course of their lifetime. A crisis is commonly considered to be an event of limited duration that is unexpected and overwhelming to the individuals who experience it. A traumatic event is considered an incident in which an individual perceives actual or threatened death or serious injury or threat to the physical integrity of self or others, and the individual's response involves intense fear, helplessness, or horror. During crises and traumatic events, individuals may feel overwhelmed and unable to use their normal means of coping with stress. This can leave long lasting deficits in:

- Cognitive abilities.
- Emotional stability.
- Physical well-being.
- Spiritual functioning.
- Relationships.

Acute traumatic stress is usually a temporary response to overwhelming stress. Most individuals are resilient to daily stress and have coping techniques to help them effectively manage the occasionally intense stressors of their jobs. Individuals normally recover from critical incident stress and may even experience personal growth if given the proper tools to handle the experience and they receive proper emotional support.

Disaster Site Workers are not immune from the effects of horrific events such as gruesome deaths, suicides, violent injuries, workplace violence, and other "unthinkable" events that seem to be occurring all too frequently in today's world. Workers may also experience debilitating stress symptoms as a cumulative effect of many stressful situations on the job. The potential for acute or chronic stress to progress to post-traumatic stress disorder is amplified by threats of terrorism.

Anyone involved in traumatic events has the potential to experience:

- Physical illness.
- Inability to function adequately on the job.
- Depression.
- Anxiety.
- Marital and family conflict.
- Death through suicide as a reaction to overwhelming stress.

Team Well Being: During a disaster, you may see and hear things that will be extremely unpleasant.

Vicarious trauma is the process of change in the rescuer resulting from empathic engagement with survivors. It is an "occupational hazard" for helpers.

Do not over identify with the survivors. Do not take on the survivors' feelings as your own. Taking ownership of others' problems will compound your stress and affect the Disaster site workers' overall effectiveness.

Be alert to signs of disaster trauma in yourself, as well as in disaster victims, so that you can take steps to alleviate stress.

What is a Traumatic Incident? A situation that is extraordinary and may overwhelm coping mechanisms and causes the worker to experience a stress reaction.

Unusually strong emotional reactions may happen at any time during or after the incident. This is Traumatic Stress.

Symptoms of a Traumatic Stress Reaction:
Symptoms can last a few days, a few weeks, a few months and occasionally longer. Support and understanding of loved ones is needed. Professional assistance also may be necessary.

Traumatic Stress symptoms can be broken down into 4 categories.

Emotional:

- Anxiety
- Grief
- Fear
- Depression
- Denial
- Intense Anger
- Agitation
- Fear of recurrence
- Feeling helpless
- Guilt
- Severe panic
- Uncertainty
- Apprehension
- Feeling overwhelmed
- Irritability
- Isolation and withdrawal.
- Mood swings
- Feeling stunned, numb, or overwhelmed
- Sadness, depression, and grief
- Concentration and memory problems
- Relationship conflicts/marital discord

Cognitive:

- Poor attention
- Poor concentration
- Hypervigilence
- Nightmares
- Poor decisions
- Memory problems
- Poor problem solving
- Intrusive images
- Self-blame or the blaming of others
- Heightened or lowered awareness
- Loss of time, place, or person orientation

Behavioral:

- Change in activity
- Pacing
- Withdrawal
- Antisocial acts
- Change in speech patterns
- Emotional outbursts
- Increase or decrease in appetite
- Startle reflex intensified
- Change in sexual functioning
- Erratic movement
- Suspiciousness/paranoia
- Alcohol and/or drug consumption

Physical:

- Fatigue
- Muscle cramps
- Chest pain
- Grinding of teeth
- Rapid heartbeat
- Headaches
- Profuse sweating
- Hyperactivity.
- Nausea
- Twitches
- Difficult breathing
- Elevated blood pressure
- Thirst
- Visual difficulties
- Loss of appetite.
- The inability to sleep.
- Fatigue or low energy.
- Diarrhea, stomach pain, or nausea.

Risk Factors:

- Life threatening danger/physical harm
- Exposure to gruesome death or bodily injury
- Extreme environmental/human violence or destruction
- Loss of home, possessions, community
- Loss of communication with, or support from, close relations
- Extreme fatigue, weather exposure, hunger or sleep deprivation
- Extended exposure to danger, loss, or emotional/physical strain
- Exposure to toxic contamination

There are steps that Disaster Site Worker team leaders can take to promote team well-being before, during, and after an incident:

Provide pre-disaster stress management training to all DSW personal.

Brief DSW personnel before the effort begins on what they can expect to see and what they can expect in terms of emotional response in the survivors and themselves.

Emphasize that the DSW is part of a team. Sharing the workload and emotional load can help defuse pent-up emotions.

Encourage DSWs to rest and re-group so that they can avoid becoming overtired.

Direct DSWs to take breaks away from the incident area, to get relief from the stressors of the effort.

Encourage DSWs to eat properly and maintain fluid intake throughout the operation. Explain that they should drink water or other electrolyte-replacing fluids, and avoid drinks with caffeine or refined sugar.

Rotate teams for breaks or new duties (i.e., from high-stress to low-stress jobs). Team members can talk with each other about their experiences. This is very important for their psychological health.

Phase out workers gradually. Gradually phase them from high- to low-stress areas of the incident.

Conduct a brief discussion (defusing) with workers after the shift, in which workers describe what they encountered and express their feelings about it.

Arrange for a debriefing 1 to 3 days after the event in which workers describe what they encountered and express their feelings about it in a more in-depth way.

Social support is one of the most important and powerful stress reducers.

Disaster Stress Interventions: Two powerful ways of healing from disaster.

- For the individual, creating and telling the story of the disaster
- Rituals and memorials, which bring the community of responders, victims and public together

Traumatic Incident Stress Management Techniques: DSWs may invite a mental health professional trained in Critical Incident Stress Management (CISM) to conduct a Critical Incident Stress Debriefing (CISD).

CISD is one type of interventions within a more comprehensive, multi component crisis intervention system that is based on a careful assessment of the needs of a group or individual.

CISD should not be used as a stand-alone intervention, it should be used in conjunction with other types of intervention, such as counseling.

A CISD has seven phases:

1. Introductions and a description of the process, including assurance of confidentiality
2. Review of the factual material about the incident
3. Sharing of initial thoughts/feelings about the incident
4. Sharing of emotional reactions to the incident
5. Review of the symptoms of stress experienced by the participants
6. Instruction about normal stress reactions
7. Closing and further needs assessment

Types of Traumatic Incident Stress Management:

Defusing

- Shorter, less formal version of a debriefing
- Best conducted within 1 to 4 hours after an incident
- Confidential and voluntary
- Sharing of reactions to an incident and venting emotions
- Main purpose: stabilize people affected by the incident so that they can return to their normal routines
- Often, done before responders return home

Types of Traumatic Incident Stress Management:

Debriefing

- Proactive intervention involving a group meeting/discussion about a particularly distressing event
- Designed to mitigate the impact of the event and assist those in recovery from the associated stress

- Facilitated by a specially trained team
- Ideal to have it conducted between 24 and 72 hours after the incident

Types of Traumatic Incident Stress Management:

Grief and Loss Session

- Structured group or individual session following a death
- Assists people in understanding their own grief reactions
- Creates a healthy atmosphere of openness and dialogue around the circumstances of the death

Types of Traumatic Incident Stress Management:

Crisis Management Briefing

- A large homogeneous group intervention used before, during and after crisis.
- Present facts, facilitate a brief controlled discussion, Q & A and information on stress survival skills and/or other available support services.
- May be repeated as situation changes.
- To schedule a CISD, you should contact the Red Cross, local emergency management agency, or community mental health agency. You could also ask your local fire or police department for help in contacting the appropriate person.
- Participation in CISD should be voluntary.

Managing Stress During Disaster:

- On scene briefings for incoming responders
- Develop a "buddy" system
- Watch out for each other
- Take care of yourself physically
- Take frequent rest breaks
- Drink plenty of fluids
- Eat healthy foods
- Take breaks away from the work area
- Give yourself permission to feel rotten

Fatigue as a Health Hazard

The Health Effects of Working Long Hours

- Stress
- Causes a lack of concentration, memory loss and errors in judgment
- Depression
- May be caused by extended periods of stress
- Can be caused when workers experience high demands and low levels of control over their work
- Burnout (Work Exhaustion)
- When workers undergo extended periods of high demanding & high stress situations coupled with long hours & work overload

Managing Stress after a Disaster: You should spend some time thinking about other ways to reduce stress personally. Only you know what makes you able to reduce stress within yourself. Expending the effort required to find personal stress reducers is worthwhile before an incident occurs. You can take the following preventive steps in your everyday life:

- Get enough sleep.
- Exercise.
- Eat a balanced diet.
- Balance work, play, and rest.
- Allow yourself to receive as well as give. Remember that your identity is broader than that of a helper.
- Connect with others.
- Use spiritual resources.
- Attend end of shift briefing
- Reach out
- Reconnect
- No big life decisions
- Rest
- Eat well

- Mood swings
- Slow down
- Don't overwhelm children
- Stress relief
- Recall what is important
- Avoid use of drugs or alcohol

Experienced rescue workers find these steps helpful in controlling their stress levels, but, in some cases, it might be necessary to seek help from mental health professionals.

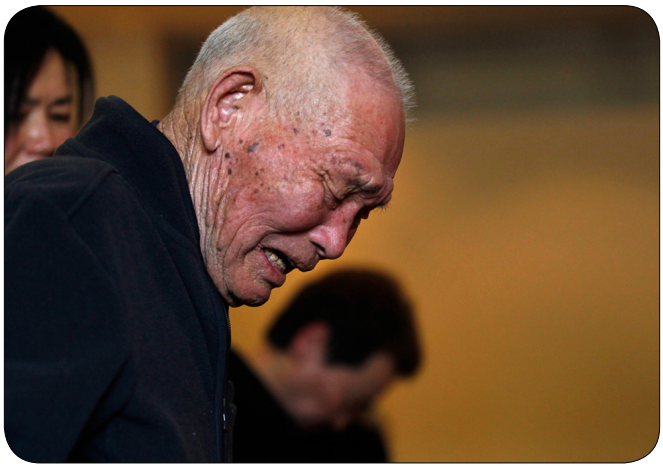
Helping Children Feel Better:

- Reassure children they are safe
- Encourage children to talk and ask questions
- Carry out daily routines and outings (when possible)
- Screen amount of TV and exposure to disaster

Available Resources:

- Mental health benefits may be available through your insurance provider
- Local and national organizations
- Community services and hotlines
- Local Mental health resources
- Financial resources
- Legal resources
- Spiritual resources

Acknowledgment: The original version of this presentation was developed by Jamie F. Becker of the Laborers' Health and Safety Fund of North America.



Post-Traumatic Stress Disorder (PTSD)

The following information, regarding PTSD, is provided to familiarize the participant with the symptoms of PTSD, noting the differences from normal stress reactions such as critical incident stress. The essential differences include:

- The intensity of symptoms.
- The degree to which the symptoms interfere with normal activities.
- The duration of the symptoms.

The key characteristics of PTSD include the following:

- The individual experienced, witnessed, or learned of a traumatic event involving actual or threatened death or serious injury.
- The person's response involved intense fear, horror, or helplessness.
- The person persistently re-experiences the traumatic event in one or more of the following ways:
- Distressing, intrusive images, thoughts,
- and dreams about the event
- Acting or feeling as though the traumatic event is being relived (flashbacks)

The person persistently attempts to avoid factors associated with the trauma such as:

- Thoughts
- Conversations
- Places
- Feelings
- Activities
- People

Experiences a numbing of general responsiveness such as the:

- Inability to remember important aspects of the traumatic event.
- Lack of interest or participation in activities.
- Feeling of detachment from others.
- Restricted ability to feel and express emotions.
- Sense of hopelessness about the future.

The person experiences increased physical and psychological arousal (not present before the traumatic event) with at least two of the following:

- Difficulty falling or staying asleep
- Irritability or outbursts of anger
- Difficulty concentrating
- Exaggerated startle response
- Hyper vigilance (exaggerated watchfulness)

Physiological reactions that may include:

- An increase in blood pressure.
- Rapid heart rate.
- Muscle tension.
- Rapid breathing.
- Nausea.

The symptoms listed above last for more than one month and cause significant distress or impairment in a person's life.

8] Respiratory Protection

The disaster site worker must be properly protected from chemical, biological, dust and other hazards present at a disaster event. The use of respiratory protection by Disaster Site Workers in a CBRNE environment must meet the proper protection requirements. The selection of the correct type of respirator is critical. The respirator user must be familiar with the assigned respirator, be able to pass medical and fit testing requirements, and be able to perform proper maintenance (i.e., changing filters and cleaning of the respirator).

The respirator represents the last line of defense against airborne hazards for the disaster site worker. If the correct respirator is not used or is used improperly, the health and safety of the user will be compromised. If filters are not changed at the proper intervals on an air-purifying respirator, the respirator will be become ineffective. If the respirator is not cleaned properly and periodically, it will not perform adequately.

The Disaster Site Worker must be aware of the different types of respirators and the circumstances were they are used. The Disaster Site Worker also must be aware of the respirator checks, fit testing requirements, respirator maintenance requirements and cleaning procedures. OSHA respiratory standards, 29 CFR 1926.103 and 29 CFR 1910.134 are identical. The standard addresses selection, medical evaluation, fit testing, use, maintenance and care, breathing air quality and use, training and program evaluation. The Disaster Site Worker and their team leaders need to be aware of the respiratory standard requirements.

RESPIRATORS ARE NEEDED WHEN:

- You are In an oxygen-deficient atmosphere
- When chemical "Permissible Exposure Limits" are exceeded
- When dusts, mists, gases, vapors, or fumes could cause damage to your lungs
- As a pre-caution in many terrorist events

Oxygen Deficiency: Oxygen deficiency can occur in confined or enclosed spaces, during fires or large chemical releases.

Normal air contains 21% oxygen. Oxygen content below 19.5 % is considered "oxygen deficient."

Only a supplied air respirator can protect against the effects of oxygen deficiency.

Permissible Exposure Limits (PELs): Most chemicals and dusts have limits in the air that will cause adverse health effects if exceeded.

If airborne levels cannot be reduced below these limits by other means, respirators must be provided to protect exposed employees.

Dusts, Mists, Gases, Vapors, or Fumes:

- Post explosives atmospheres
- Demolished buildings
- Construction or Demolition Activities
- Mold

IDLH: "IDLH" means immediately dangerous to life or health

- Most chemicals have a listed IDLH level link to NIOSH IDLH Table
- Oxygen deficiency is also IDLH
- IDLH conditions can occur in confined or enclosed spaces, large chemical spills or leaks and fires

Reduce by Another Means: The first choice is to reduce chemical exposure by other means. Most people do not like wearing respirators and may remove them to talk to another worker. Tight-fitting respirators are especially susceptible to leaking.

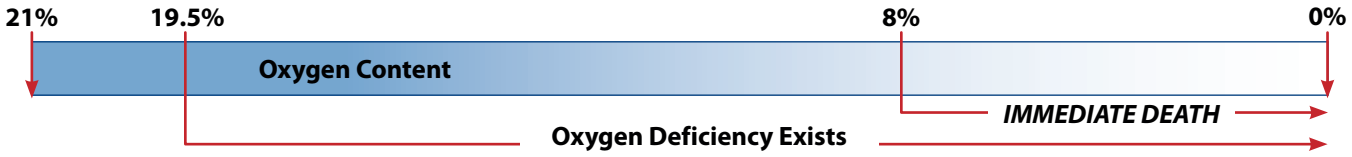
Use one or more of the following controls to reduce exposure to airborne chemicals:

- Ventilation
- Dust suppression with water
- Eliminate use of chemical
- Substitute with a less toxic chemical
- Isolate or enclose the chemical processes
- Other processing changes

Half Mask Respirator

Chemical Cartridge

Pre-Filter (P95)



Types of Respirators:

- **Air-purifying respirators:** filters air through cartridges or filtering face pieces (dust masks)
- **Powered air-purifying respirators:** filters air through cartridges with assistance of a blower.
- **Airline respirators:** provides unlimited clean air from a compressor.
- **Self-contained breathing apparatus (SCBA):** provides 30- 60 minutes of clean air from a tank.
- **Escape respirators:** provides air for escape only from a small bottle.
- **CBRN NIOSH Approved Respirators:** NIOSH approved chemical resistant masks and cartridges

Chemical Cartridges and Filters: Cartridges absorb chemicals in the form of gases, vapors, and fumes from air. Filters block dusts, mists, and particulates from the air. Sometimes you need either a cartridge, filter, or a combination of both.

Limitations:

- Chemical cartridges can absorb only so much chemical.
- When their capacity is reached, breakthrough will occur.
- You can't always tell if a respirator leaks by a chemical odor.
- Some chemicals have no odor, or can only be smelled at high levels.
- Plugged filters are hard to breath through

Cartridges must never be used in concentrations that are IDLH.

NIOSH Filter Classifications:

N - For solid particulates and non-oil aerosols that do not degrade filter performance.

R - For solid particulates and degrading oil-based aerosols. R filters have "Use Limitations."

P - For solid particulates and degrading oil-based aerosols. P filters have no "Use Limitations" other than those normally associated with particulate filters.

Three efficiency levels: 95%; 99%; 99.97%.

Full Face Respirator

Powered Air Purifying Respirator

Contained Breathing Apparatus (SCBA)

Supplied Air Purifying Respirator

CBRN Respirator (Gas Mask)

Escape Respirator

P-100 HEPA Filter

Escape Respirator

Air-Purifying Respirators:

Types

- Half Mask
- Full Face
- CBRN Gas Mask

Limitations

- Cartridges must be changed periodically to provide protection.
- The right cartridge for the contaminant of concern must be chosen.

Powered Air Purifying Respirator (PAPR): Air-purifying respirators trap air contaminants in a cartridge or filter when the wearer inhales.

- Particulate respirators capture dusts, mists and welding fumes.
- Chemical cartridge respirators capture gases and vapors.
- Combination cartridges are available.

Limitations

- Cartridges must be changed periodically to provide protection.
- The right cartridge for the contaminant of concern must be chosen.
- Air-purifying respirators provide protection up to 10 or 100 times the PEL.
- Will not provide adequate protection in confined spaces, major leaks or spills or for certain highly toxic chemicals.
- Will not work in Oxygen Deficient Atmospheres

Protection Factors

Concentrations of a chemical shall be monitored in the air whenever possible and employees shall never be exposed over the Permissible Exposure Limit (PEL) of any substance without the correct respirator. Respirators are assigned a protection factor based on the type of Respirator. For example, if the PEL for a certain chemical is 100 ppm a half mask respirator would be good to 1000 ppm of that chemical.

- Half Mask Respirators - 10xPEL
- Full Face Respirators - 50xPEL
- Supplied Air Respirator - 1000xPEL
- Self Contained Breathing Apparatus - 1000xPEL

Supplied Air Respirators:

Types

- Airline Respirators
- Self Contained Breathing Apparatus (tank)
- Emergency Respirator (5 min)
- Air is supplied from an outside source, provided
- Clean air comes from a compressor or tank and provides the highest protection to users.
- Supplied air respirators can provide protection up to 1000 to 10,000 above the permissible exposure limit, depending on the type of respirator.
- Must use Grade D air

Limitations

- Be careful – these do not provide clean air without a filter system!!
- Oil-lubricated compressor are especially hazardous. You must test for carbon monoxide or have a high temperature alarm.
- Locate air intake away from engine exhaust which can contaminate breathing air.

Use Supplied Air Respirators when there is:

- Oxygen deficiency
- High levels of toxic chemicals in the air – above "IDLH" levels
- Other conditions of high levels of highly toxic chemicals in the air
- Firefighting

Training and Information: Prior to allowing the employee to wear a respirator, the employer shall implement a training program and ensure that each employee can demonstrate knowledge of at least the following:

- Why the respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator
- What the limitations and capabilities of the respirator are
- How to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions
- How to inspect, put on and remove, use, and check the seals of the respirator

- What the Procedures are for maintenance and storage of the respirator:
- How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators;

Medical Evaluation: The employer shall identify a physician or other licensed health care professional (PLHCP) to perform medical evaluations using a medical questionnaire or an initial medical examination that obtains the same information as the medical questionnaire.

- The employer must provide the health care professional with:
- The type and weight of the respirator to be used by the employee;
- The duration and frequency of respirator use (including use for rescue and escape);
- The expected physical work effort;
- Additional protective clothing and equipment to be worn;

Temperature and humidity extremes that may be encountered.

Records of medical evaluations required by this section must be retained and made available in accordance with 29 CFR 1910.1020. Privacy requirements must be followed.

Respirator Selection: The employer shall select and provide an NIOSH-certified respirator based on the respiratory hazard(s) to which the worker is exposed and workplace and user factors that affect respirator performance and reliability. At a CBRNE event, the hazards may be difficult to determine.

The employer shall identify and evaluate the respiratory hazard(s) in the workplace; this evaluation shall include a reasonable estimate of employee exposures to respiratory hazard(s) and an identification of the contaminant's chemical state and physical form. Where the employer cannot identify or reasonably estimate the employee exposure, the employer shall consider the atmosphere to be IDLH.

Remember in an IDLH atmosphere, an atmospheric supplying respirator such as a self-contained breathing apparatus or supplied air respirator must be used. The breathing air used for atmospheric supplying respirators must be Grade D air. At a CBRNE event, the logistics of having an ample supply of SCBA bottles or refilling capacity must be considered. Compressors for filling SCBA bottles or supplied air systems must be located in safe area to ensure the breathing air is not contaminated.

Respirator Fit Testing: Before an employee may be required to use any respirator with a negative or positive pressure tight-fitting face piece, the employee must be fit tested with the same make, model, style, and size of respirator that will be used.

The tight-fitting face piece respirator user must be fit tested prior to initial use of the respirator, whenever a different respirator face piece (size, style, model or make) is used, and at least annually thereafter.

The employer shall conduct an additional fit test whenever the employee reports, or the employer, PLHCP, supervisor, or program administrator makes visual observations of, changes in the employee's physical condition that could affect respirator fit.

Such conditions include, but are not limited to, facial scarring, dental changes, cosmetic surgery, or an obvious change in body weight.

Cartridge and Filter Color Coding Chart

- Color. . . . . Type of Protection
- Black. . . . . Organic Vapor Cartridge
- White . . . . . Acid Gas Cartridge
- Yellow . . . . . Organic Vapor and Acid Gas Cartridge
- Green . . . . . Ammonia and Methylamine Cartridge
- Olive Green . . . . . Organic Vapor and Formaldehyde Cartridge
- Purple (Magenta). . . Dust, Fumes, Mists, Asbestos, Radionuclides and Highly Toxic Particulates (HEPA) Filter
- Black/Purple . . . . . Organic Vapor and Hepa Combination
- White/Purple . . . . . Acid Gas and Hepa Combinationv
- Yellow/Purple . . . . . Organic Vapor/Acid Gas and Hepa Combination
- Green/Purple . . . . . Ammonia/Methylmine and Hepa Combination
- Olive Green/Purple. . Organic Vapor/Formaldehyde and Hepa Combo
- Pre-Filters. . . . . Dusts, Fumes & Mists or Pesticides or Paint

Qualitative Fit Test (QLFT) Protocols:

- Saccharin
- Bitrex
- Irritant smoke

Quantitative Fit Test (QNFT) Protocols:

- Generated Aerosol (corn oil, salt, DEHP)
- Condensation Nuclei Counter (PortaCount)
- Controlled Negative Pressure (Dynatech FitTester 3000)

Fit testing cannot be done if you have facial hair between mask and skin.

The test subject will wear any applicable safety equipment, i.e. hard hat, other head protection, welders goggles, welders helmet, etc., that may be worn during actual respirator use which could interfere with respirator fit during the fit test.

User Seal Check Procedures: You need to conduct a seal check each time you put your respirator on; before you enter the respirator use area. The purpose of a seal check is to make sure your respirator (which has been previously fit-test by your employer) is properly positioned on your face to prevent leakage during use and to detect functional problems.

Positive Pressure Check:

1. If removable, take exhalation valve cover off.
2. Cover the exhalation valve completely with the palm of your hand while exhaling gently to inflate the face piece slightly.
3. The respirator face piece should remain inflated (indicating a build-up of positive pressure and no outward leakage).
4. If you detect no leakage, replace the exhalation valve cover (if removed), and proceed to conduct the negative pressure check .
5. If you detect evidence of leakage, reposition the respirator (after removing and inspecting it), and try the positive pressure check again.

Negative Pressure Check:

1. Completely cover the inhalation opening(s) on the cartridges or canister with the palm(s) of your hands while inhaling gently to collapse the face piece slightly.
2. If you can't use the palm(s) of your hands to effectively cover the inhalation openings you may use filter seal(s) or thin rubber gloves.
3. Once the face piece is collapsed, hold your breath for 10 seconds while keeping the inhalation openings covered.
4. The face piece should remain slightly collapsed, indicating negative pressure and no inward leakage.
5. If you detect no evidence of leakage, the tightness of the face piece is considered adequate, the procedure is completed and you may now use the respirator.
6. If you detect leakage, reposition the respirator (after removing and inspecting it) and repeat both the positive and negative fit check.

Program Evaluation: The employer will conduct evaluations of the workplace to ensure that the written respiratory protection program is being properly implemented, and to consult employees to ensure that they are using the respirators properly.

Record Keeping: This section requires the employer to establish and retain written information regarding medical evaluations, fit testing, and the respirator program. This information will facilitate employee involvement in the respirator program, assist the employer in ensuring the adequacy of the program, and provide a record for compliance.

9] Decontamination

Purpose for Decontamination: The four most important reasons for decontaminating exposed victims and workers are:

- To remove the agent from the victim's skin and clothing.
- To protect responders from secondary transfer exposures.
- To provide victims with psychological comfort.
- To keep from taking home toxic substances to your family.

Separating People From the Hazard: The first step is to separate the victims from the chemical agent.

Indoors:

- Shutting off the intake ducts and vents and setting the exhaust system to maximum to vent the fumes to the outside.
- Removing the people from the building.

Outdoors:

- **Evacuate victims upwind and uphill of the hazard.**
- Remove victims clothing if exposed to agent

Decontamination methods may be either:

1. Physical removal.
2. Chemical removal (deactivation/neutralization).
3. Evaporation - Allowing for chemicals to evaporate

Physical Removal of Chemical Agents:

Gross decontamination is removing the agent from the victim. Both the victims clothing and waste water will need to be collected. Physical removal can be:

- Scraping, sweeping, brushing, or vacuuming: (e.g., using a tongue depressor to scrape most of the agent off the skin).
- Hosing: Flush the victim's body with large amounts of water (e.g., using a fire hose and spray nozzle). Water temperature is an issue because cold water can cause hypothermia in victims and personnel, even in warm weather.
- Absorbent material: Use absorbent material (e.g., flour, earth, dry soap powder, Fuller's Earth, Dutch Powder) to absorb the chemical; then wipe it off with wet tissue.
- Soap and water: Wash the victim with large amounts of soapy water (either fresh water or seawater).
- Disposal of Contaminated Clothing and Equipment: A clothing dump should be established downwind of the decontamination facility. If possible, the discarded items should be placed in plastic bags, airtight containers, or buried to prevent toxic vapors from escaping.

Chemical Removal of Contaminants: In some cases, a particular chemical preparation can be applied to the contaminant that will react with it and convert it into something less toxic. Using the wrong chemicals, however, may cause dangerous interactions.

The most common chemical removal method used on people (as opposed to equipment and surfaces) is to wash the skin with a 0.5 percent hypochlorite solution (i.e., diluted bleach). Caution should be taken if decontamination occurs indoors because bleach solutions can cause off-gassing of chlorine vapor.

Evaporation: Aeration: For vapor contamination, place the victim outside in a breeze if possible, and remove outer clothing. (This may be sufficient decontamination for vapor-only exposure.)

Safety of Responders: The safety of responders and workers is of foremost importance. All responders who have the potential to encounter contaminated victims or to be exposed to contaminated material must wear protective clothing and respiratory protection appropriate to the level of protection required based upon the CBRNE agent. Responders can ensure maximum consideration for safety of themselves and victims by instituting and following established safe work practices.

- **If the agent is unknown, Level A is recommended** (Level B is minimum required) as the safest level of protection pending agent identification.
- Minimize contact with the victims and practice contamination avoidance.
- Knowledge of agents and signs/symptoms of their effects is essential.
- Because of the possibility of

blood-borne
pathogens, institute universal safety precautions.

Field Decontamination: The field decontamination operation must be upwind/uphill from the release site, and provisions must be made to change location if wind direction changes.

In addition to the actual decontamination system, materials, and personnel, provisions should be made for the establishment and marking of zones, including:

Hot zone (exclusion zone) - A visible "hot line" should be apparent that separates the contaminated area from the agent-free zone.

Warm zone (contamination reduction zone) - The "decon" zone, where decontamination takes place. A transition area should be provided for movement from this area to the support/treatment areas.

Cold zone (support zone, clean zone) - An evaluation and support area for monitoring casualties following decontamination (medical monitoring and chemical monitoring to confirm decontamination).

- Site security to prevent the spread of contamination to and from the decontamination area.
- A clean area within the decon zone where workers can rest without masks and equipment.
- Providing victims with uncontaminated paper gowns, clothing, and/or blankets after decontamination.

Isolate and Organize Ambulatory Victims: After establishing the decontamination corridor, personnel must effectively communicate to victims what action can be expected as they pass through the corridor during the decontamination process (i.e., spread arms/legs out and wash from top down). This can be done with loudspeakers or public address (PA) systems.

- **Evacuate victims upwind and uphill of the hazard.**
- Segregate the victims showing symptoms (symptomatic) from the victims not showing symptoms (asymptomatic).
  - Segregate men and women.
- Collect personal items (e.g., use a plastic bag and a method of identification; voucher personal articles for later return).
- Special consideration should be given for families, small children, elderly, special needs persons Decontaminate Victims

Technical Decontamination Process: During decontamination, have victims remove outer clothing down to their undergarments (removing undergarments may be necessary) to increase the thoroughness of the decontamination process. Removal of clothing removes approximately 80 percent of the contamination.

When handling victims, consider these techniques to provide protection for them:

- Use supports to hold stretchers and backboards off the ground (e.g., milk crates)
- Keep clothing away from the victim's face during removal (limits victim breathing in the agent).
- Remove/cut clothing from head to toe, front to back.
- When removing clothing from victims, do not cut through holes or tears. These are clues to the event and may prove to be useful evidence.

Additionally, consider implementing the following techniques:

- Remove tight fitting clothing, which can hold contaminated liquid and vapor close to the body.
- Use bags such as trash bags, biohazard bags, or other suitable bags of size and strength to collect and identify individual clothing removed from victims.
- Place bagged clothing into sealed containers (tagged for identification) for a more thorough inspection later.
- Triage and victim tagging (i.e., identifying the contaminant and the decontamination procedures used).If the hazard is biological or radiological, wet the victims down before removing individual clothing. This will embed the agent on the clothing of the victims and reduce the potential for the biological or radiological agent adhering to the bodies of the victims or becoming re-aerosolized.

- If the hazard is a suspected liquid mustard (blister) agent, blot the agent off (using a pinching motion) to remove the liquid.

Types of Decontaminates: When capabilities and resources allow, decontaminates of choice are:

- Water only (good),
- Soap and water (better),
- Household bleach (best if bacteria or biological).
    - 5% bleach solution applied to equipment
    - 0.5% bleach solution for victims followed by complete flushing is suggested when decontaminating

Recent information published in the Journal of the American Medical Association (JAMA) has begun to question whether soap and water may be just as effective in decontaminating the skin.

Some people may have allergic reactions when decontaminating with bleach products. Do not apply the bleach solution to the victim's face.

Decontamination Differences: There are important differences between a Hazmat incident and a CBRNE incident. Personnel must be aware of these differences and take the proper precautions for self-protection, protection of other workers, and protection of the public during response actions.

With most CBRNE agents, responders must complete decontamination swiftly in order to save lives and minimize victims. Although a rapid response is required because of the speed with which many of the toxic chemical agents affect the body, responders must resist rushing in to assist until the complete situation is identified.

The large number of expected victims is the first major difference between a standard Hazmat situation and a CBRNE incident. A CBRNE event may require responders to do the following:

- Control
- Triage
- Decontaminate
- Track

Scene control at a CBRNE incident may involve:

- A large area.
- A mass casualty/mass fatality situation with numerous responders and volunteers who want to help.
- Media seeking information about the incident.

A terrorist CBRNE incident is a federal crime scene. During the decontamination process, responders must make every effort to preserve evidence for eventual use in apprehending and prosecuting perpetrators. Use pools or line areas with plastic to control runoff control and reduce the spread of the hazard. Keep decontamination runoff away from sewer drains, groundwater, streams, and watershed areas. If runoff cannot be controlled, notify the appropriate agencies (e.g., sewer, water, and environmental).

Water should then be allowed to evaporate from the area and the plastic should be considered hazardous. Water may need to be pumped off by HAZMAT teams.

Emergency or Mass Decontamination: Mass decontamination can take many improvised forms with the intent being rapid removal of agents. OSHA recommends a high-volume, low-pressure water system as the default standard for mass decontamination. High-pressure water systems are discouraged because they may force contaminant through the clothing and increase contamination on the victim.

Commercially available decontamination systems are available and effective, but most of these systems are require transportation to the incident site, which may

cause undesirable delays. However, if these systems are centrally located and rapidly deployable, they offer an advantage over other systems because they:

- Provide heated showers.
- Provide cover as part of the system.
- Provide systems to control runoff.

The use of chlorinated swimming pools, elevated master nozzles, fog streams, and public school shower facilities are other improvised methods that meet the intent of emergency decontamination. The objective is the rapid and gross removal of a majority of the agent involved in the incident. Consider weather conditions and water pressure when choosing a site.

Provide appropriate personal cover by using items such as ponchos, TYVEK coveralls, and salvage covers. Incident logistics coordinators or responders might procure blankets, large towels, sheets and tablecloths from local restaurants, stores, hospitals and hotels. Consider providing overhead cover to afford additional consideration for modesty.

Establish a triage, treatment, and transport area in the clean zone, in a secure location that is large enough to accommodate all victims. Ensure that all responders are aware of the signs and symptoms of chemical exposure.

Transport of Victims: Casualties should be decontaminated before being transported to medical facilities to avoid contamination of transport personnel and equipment. If contaminated victims must be transported, the transport personnel must wear PPE, and equipment should be used that can be easily decontaminated. The ambulance and equipment must be decontaminated before reuse.

Absorbents: Personnel may use commercially available materials for control of liquid contamination at an incident scene and removal of most gross chemical contamination from surfaces. Contamination will be transferred to the absorbent material that must be treated as contaminated waste and disposed of accordingly. Since there is no preparation time for absorbent material application, implement the material utilization as soon as it arrives at the incident scene.

Non-Aqueous Methods: Although non-aqueous (without water) methods provide a means for contaminant removal, they do have advantages as well as limitations. If their use is expedient, the use of dry, gelled, or powdered decontaminating materials for absorbing the chemical agent is appropriate.

Commonly available absorbents include dirt, flour, Fuller's earth, baking powder, sawdust, charcoal, ashes, and clay materials.

Although these absorbents may provide expedient means of decontamination, their effectiveness has not been determined.

Ultraviolet Light: The use of natural degradation and ultraviolet light requires no responder preparation or application time. Ultraviolet light kills most biological agents quickly, but not spores. This extremely slow process requires exposure to sunlight. Some commercially available ultraviolet lights are starting to be used for decontamination.

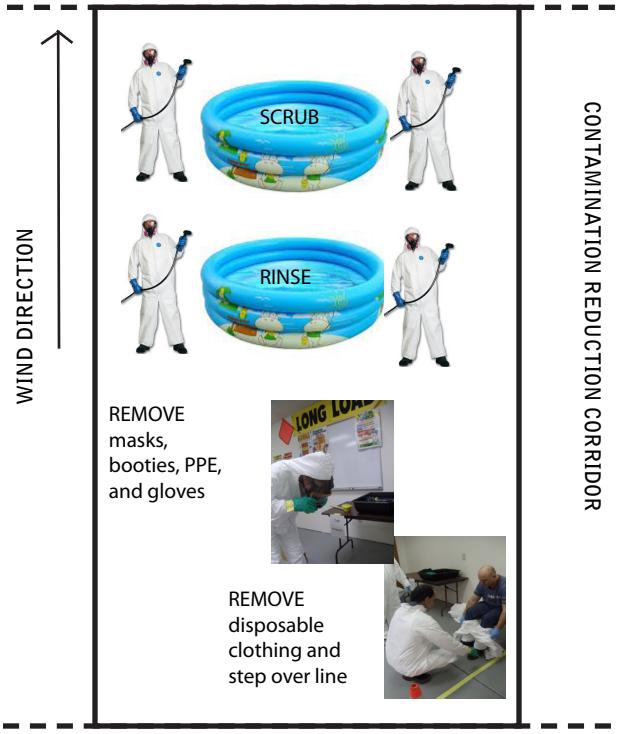
Summary: Safety of all workers and responders is of paramount importance during a disaster or CBRNE event that requires decontamination.

Emergency decontamination of victims must be accomplished quickly and may have to be improvised..

As decontaminates:

- Water is good.
- Soap and water is better (best in mass decon).
- Bleach is best (when biological agents are present).

HOT ZONE



SHOWER and change clothes

Simple Decontamination:

When dealing with non-HAZMAT, non-CBRNE disaster situations, Decontamination is still a necessary step in protecting DSWs. If no authorities give specific direction on decontamination, a simple decontamination system can be built and used to decontaminate workers. Items needed are:

- Plastic or Tarps
- Kids Swimming Pools
- Hose and Spray Nozzle
- Buckets and Brushes
- Dish Soap

The process is simple:

- Establish Hot Zone (where hazard is down wind of other zones)
- Establish Warm Zone Decontamination Reduction Corridor (decontamination area)
- Establish Support Zone (clean area where no contaminants enter, upwind of Hot Zone)
- Have Decon Workers in highest level of PPE available help decontaminate DSWs

1. First, having DSW enter the Decontamination Reduction Corridor and step into pool with full PPE and clothes on.
2. Using soap, water and a scrub brush decontaminate hands and feet (or entire body if covered)
3. Step into next pool and thoroughly rinse the DSW off.
4. Now with the clean hands, the DSW will remove their masks, booties, PPE, and gloves with the help of a decon workers.
5. Next the DSW will remove disposable clothing with help of a decon worker and step into Support Zone.
6. The DSW should then proceed to showers or change into clean clothes before going home.

Clothes that had been used in the Hot Zone or in the Decontamination Reduction Corridor should be placed in plastic bags and washed separately from other household clothing.

PPE should be decontaminated by the decon workers who then should decontaminate themselves before leaving the Decontamination Reduction Corridor.

Decontamination Summary: The Goal of Decontamination is to not take contaminants out of the HOT ZONE into the SUPPORT ZONE.

DON'T take HAZARDS home to your families.

At the minimum, WASH your hands and face before eating after working at any construction or disaster site.

Safety of all volunteers is of paramount importance.

10] Triage/Search & Rescue

Though not First Responders, Disaster Site Workers may come upon victims who need help even days later in a Disaster. The Good Samaritan laws of many States give liability protection to those who provide First Aid care in good faith and not beyond the scope of their training. In disaster situations, the "most good for the most people" principal must be followed.

Scene Safety: DSW must first ensure that they are PPE when approaching victims in disaster areas

Hardhat	Eye Protection
Work Gloves	Medical/N95 Mask
Boots	Non-latex gloves

Look around and make sure you, the DSW, are not exposed to traffic, running water, live electrical lines, or other hazards that may harm you. Assess the scene.

STOP - TAKE A BREATH - LOOK AROUND MAKE SURE IT'S SAFE- THEN HELP.

Approaching a Victim: Identify yourself by giving your name and indicating you are there to help them. Ask permission to treat the victim. If the individual is unconscious, he or she is assumed to have given "implied consent," and you may treat him or her. Ask a parent or guardian for permission to treat a child, if possible.

For purposes of Disaster Site Worker, we are only going to focus on three life saving skills.

- Opening the airway
- Controlling excessive bleeding
- Treating for shock

Unconscious Patients: When an airway obstruction is suspected because a victim is unconscious or semiconscious, DSWs should clear the airway using the Head-Tilt/Chin-Lift method.

In addition to opening the airway, this method causes little or no cervical-spine manipulation because only the head is manipulated.

Head-Tilt Chin Lift Method to Open the Airway

1. Come into sight of the victim and make contact with them by touching the shoulder and asking, "Can you hear me?" Speak loudly, but do not yell.
2. If the victim does not or cannot respond, place the palm of one hand on the forehead.
3. Place two fingers of the other hand under the chin and tilt the jaw upward while tilting the head back slightly.
4. Place your ear close to the victim's mouth, looking toward the victim's feet, and a hand on the abdomen.
5. Look for chest rise.
6. Listen for air exchange.
7. Feel for abdominal movement.
8. If breathing has been restored, the clear airway must be maintained by keeping the head tilted back. If breathing has not been restored, repeat steps 2-7.

Maintaining the Airway: If breathing has been restored, the clear airway still must be maintained by keeping the head tilted back. The airway also can be maintained by placing soft objects under the victim's shoulders to elevate the shoulders slightly and keep the airway open.

Remember that part of your mission is to do the greatest good for the greatest number of people. For that reason, if breathing is not restored on the first try using the Head-Tilt/Chin-Lift method, DSWs should try again using the same method. If breathing cannot be restored on the second try, DSWs must move on to the next victim.

Controlling Bleeding: Uncontrolled bleeding initially causes weakness. If bleeding is not controlled, the victim will go into shock within a short period of time and finally will die. An adult has about 5 liters of blood. Losing 1 liter can result in death.

There are three main methods for controlling bleeding:

- Direct pressure
- Elevation
- Pressure points

Direct pressure and elevation will control bleeding in 95% of cases.

Do not remove bandages once they have bleed through. Add additional bandages to the outside of the dressing and re-apply pressure.

Be careful not to elevate broken limbs.

The main pressure points for controlling bleeding are the femoral and brachial arteries. Applying pressure to these can reduce the blood flow to wounded areas.

Shock: Shock is a condition that occurs when the body is not getting enough blood flow. When blood doesn't circulate, oxygen and other nutrients are not carried to tissues and organs. Blood vessels begin to close and organs are damaged and, if left untreated, will shut down completely. Shock can worsen very rapidly.

Remaining in shock will lead to the death of cells, tissues, and organs - causing Death.

The main signs of shock that DSWs should look for are:

- Rapid and shallow breathing more than 30 minute
- Capillary refill of greater than 2 seconds
- Failure to follow simple commands, such as "Squeeze my hand"

Evaluate Breathing: Note if the victim's breathing is rapid and shallow, i.e., more than 30 breaths per minute.

Evaluate Circulation:

Blanch Test:

- Capillary refill: Press on the nail bed and see if color returns within 2 seconds.
- Palm: You should see the color return to the tested area within 2 seconds.
- Radial pulse: normal pulse is between 30-60 beats per min.

Because the blanch test is not valid in children, mental status should be used instead as the main indicator.

Evaluate Mental Status:

There are several ways to evaluate mental status.

- Ask, "Are you okay?"
- Give a simple command like "Squeeze my hand."

If you are concerned that there might be a language barrier or hearing impairment, reach out with both hands and squeeze one of the victim's hands. The person will squeeze back if they can.

Treat for Shock: Procedures for Controlling Shock

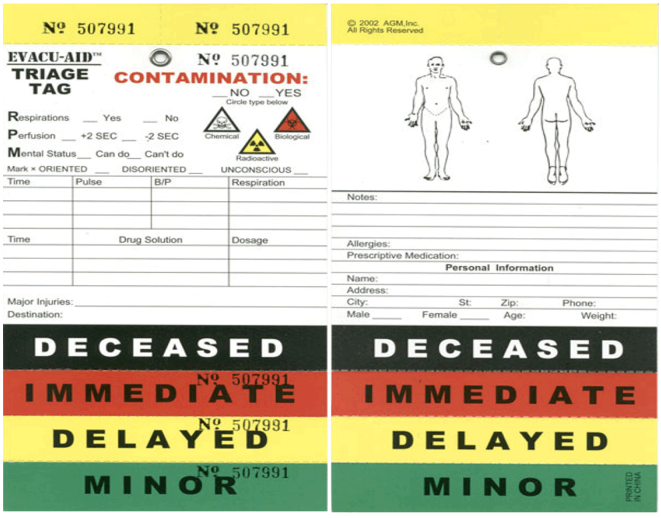
1. Maintain an open airway.
2. Control obvious bleeding.
3. Maintain body temperature
4. Acknowledge their distress.
   Provide verbal comfort.
5. Keep victim laying down and elevate feet if possible.

Avoid rough or excessive handling. It is important to maintain the victim's body temperature. If necessary, place a blanket or other material under and/or over the victim to provide protection from extreme ground temperatures (hot or cold). Position the victim on his or her back and elevate the feet 6 to 10 inches above the level of the heart to assist in bringing blood to the vital organs.

Although victims who are suffering from shock may be thirsty, they should not eat or drink anything initially because they may also be nauseated.

Triage: Triage — a French term meaning "to sort." To start triage, assess the scene and then call out to victims who can walk and have them move to a specific area. Some in this group may be able to help you with Triage.

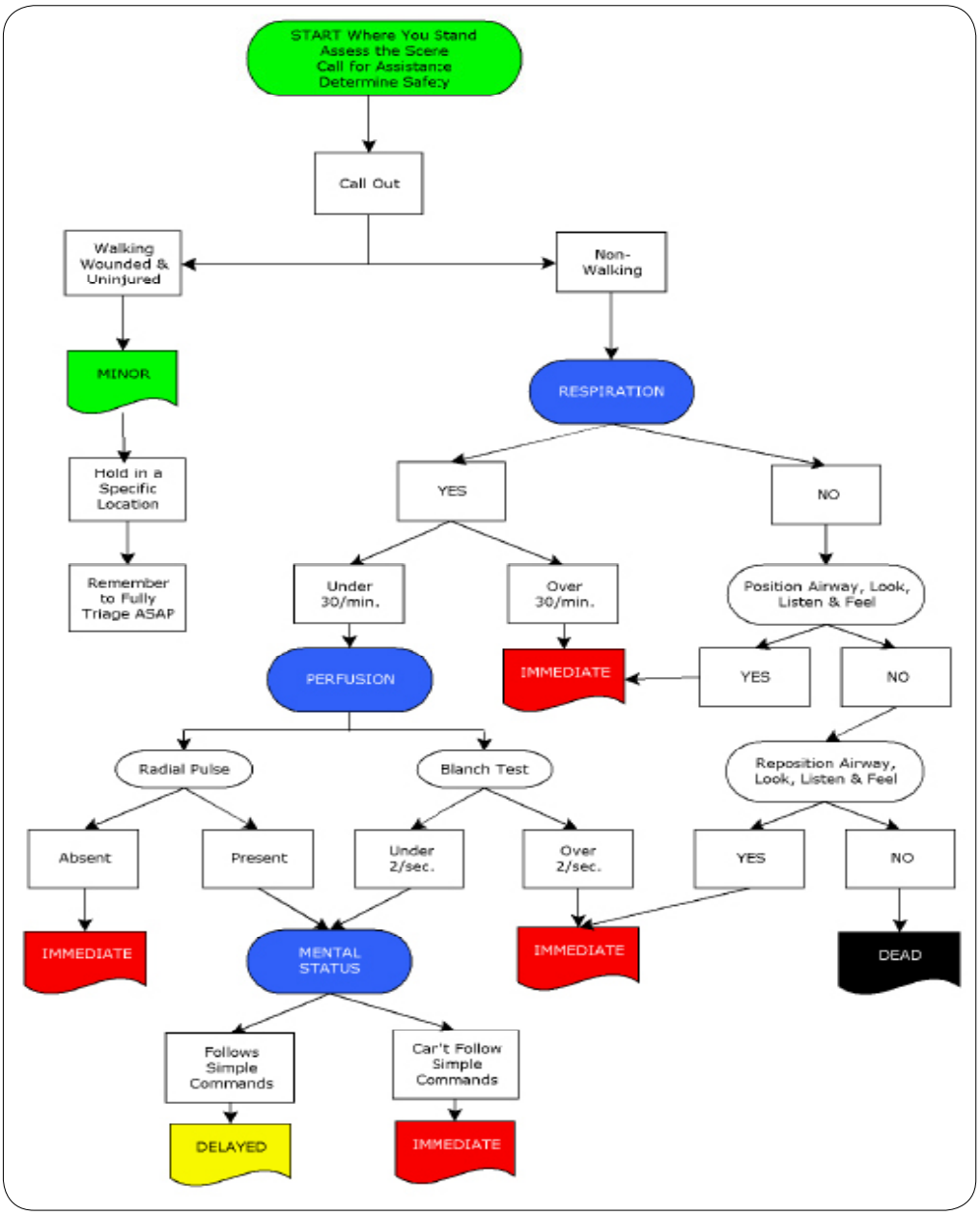
Next pick a specific pattern to Triage victims and work your way around. The goal is to treat life threatening injuries as you find them, (open airway, control bleeding, treat for shock) and then prioritize the care of those you treated temporarily and other victims.



Spend 30 seconds using the evaluation methods discussed before and then move on to next victim.

During medical triage, victims' conditions are prioritized into four categories:

- **Immediate (I):** The victim has life-threatening injuries (airway, bleeding, or shock) that demand immediate attention to save his or her life; rapid, lifesaving treatment is urgent. These victims are marked with a red tag or labeled "I."
- **Delayed (D):** Injuries do not jeopardize the victim's life. The victim may require professional care, but treatment can be delayed. These victims are marked with a yellow tag or labeled "D."
- **Minor (M):** Walking wounded and generally ambulatory. These victims are marked with a green tag or labeled "M."
- **Dead (DEAD):** No respiration after two attempts to open the airway. Because CPR is one-on-one care and is labor intensive, **CPR is not performed when there are many more victims than rescuers.** These victims are marked with a black tag or labeled "DEAD."



Do not treat minor wounds during Triage, do not spend to much time treating any patient, even those who are tagged Red.

Organize your site by setting up treatment areas, and focus trained medical attention on those who can be saved. Victims may have to be re-triaged once they reach the treatment area, so those with the most life threatening conditions may be treated first.

Adapted from Community Emergency Response Team - Disaster Medical Operations

Search And Rescue Principals For Disaster Site Workers:

Conducting Search Operations:

Disaster Site Workers are not first responders in Disasters. However, during recovery or cleanup efforts, DSWs may be asked to help with some search and rescue. Understanding the principals will help them be effective in this role. Always work with a "buddy" during search operations.

1. Stop machinery and equipment periodically and call out for victims to respond by shouting or tapping. If you hear a response, give further instruction like "wait there" or "follow my voice" depending on the condition of the building and victim.
2. If searching for victims in a building, use a systematic search pattern. Ensure that all areas of the building are covered. Examples of systematic search patterns to use include:
   - Bottom-up/top-down.
   - Use a grid pattern
   - Stay to the right as you approach every wall and doorway in a building.
3. Stop frequently to listen. Listen for tapping, movement, or voices.
4. If you hear a victim or locate one, explore multiple approaches to the victim by triangulation. Use DSWs from at least three sides to find the safest, stablest approach to remove the victim.
5. Mark searched areas to reduce duplication of efforts.
   - Mark a slash when team enters a building to search for victims.
   - After the search is completed, add another slash to create an X.
   - Mark the date/time of search on top.

Then mark actions taken by the team to right.

Mark number of fatalities below.

Leave team initials to the left.

This method:
- Indicates rescuer location.
- Prevents duplication of effort.

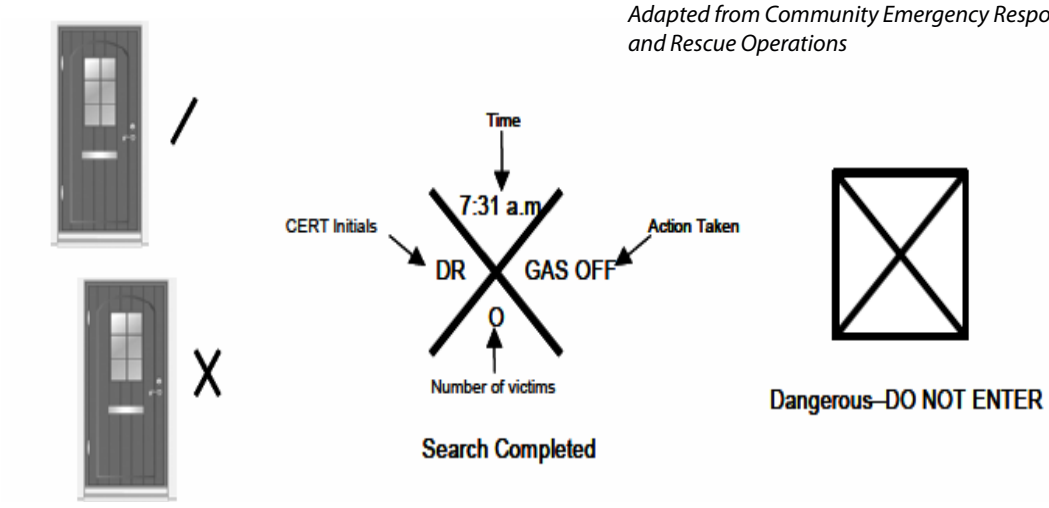
6. Report results. Keep complete records both of removed victims and of victims who remain trapped or are dead. Report this information to emergency services personnel when they reach the scene.

Conducting Rescue Operations:

Rescues involve three primary functions:

- Creating a safe rescue environment by lifting objects out of the way, using tools to move objects, and removing debris.
- Triaging or stabilizing victims.
- Removing victims in a moderately damaged building. Call in the medical team in a lightly damaged building.

Adapted from Community Emergency Response Team - Light Search and Rescue Operations

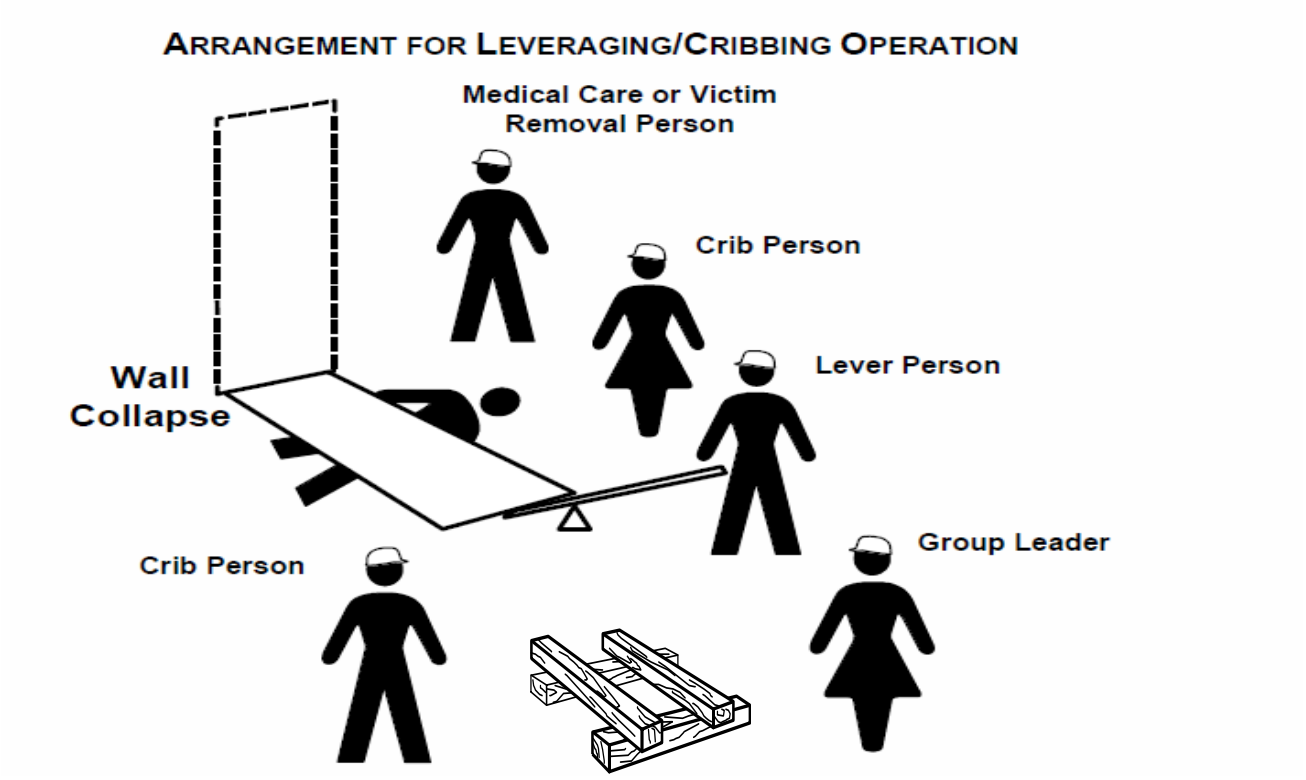


Leverage And Cribbing Principals For Disaster Site Workers:

Leveraging/Cribbing Operation:

1. Conduct a size up of the scene: Gather facts, identify hazards, and establish priorities.
2. Have one person in charge and formulate a plan of action based upon the information you have received. Identify how and where to lift and crib.
3. Gather necessary materials for lifting/cribbing operations:
   - Lever
   - Fulcrum
   - Cribbing blocks
   - Spacers/wedges
4. Use cribbing materials to stabilize the object prior to lifting.
5. Distribute crib materials as necessary to be readily accessible during the lifting operation.
6. Prepare to lift the object: Assemble the lever and fulcrum at the previously identified location.
7. Have someone available to handle the victim.
8. Initiate the lift, using the lever and fulcrum for mechanical advantage.
9. As the object is lifted, add cribbing as needed; build on the foundation of the box crib.
10. When the object is adequately supported, remove the lever and fulcrum. The victim may then be removed.
11. Re-initiate the lift and begin removing cribbing materials, reversing the process by which the crib was built.
12. Progressively lower the object to the ground.
13. Reassemble the lifting/cribbing supplies to be available for additional operations.

Adapted from Community Emergency Response Team - Light Search and Rescue Operations



Resources And Acknowledgements:

- The information contained in this handout was adapted from the following sources:
- Federal Emergency Management Agency (FEMA) - http://www.fema.gov/
- Washington State Emergency Management Department - http://www.emd.wa.gov/
- Occupational Safety and Health Administration - http://www.osha.gov/dte/index.html
- Washington State Labor and Industries - http://lni.wa.gov/
- Center for Disease Control Emergency Preparedness and Response - http://www.cdc.gov/.
- Community Emergency Response Teams (CERT) - http://www.citizencorps.gov/cert/
- The University of Washington Department of Environmental & Occupational Health Sciences (DEOHS) OSHA 5600 Disaster Site Worker Train-the-Trainer
- UCSD OSHA #5600 Train the Trainer for Disaster Site Worker - http://osha.ucsd.edu/
- Center to Protect Worker's Rights OSHA #5600 Train the Trainer for Disaster Site Worker http://www.cpwr.com/training-osha.html

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