

THE CAPITOL REGION  
METROPOLITAN MEDICAL RESPONSE SYSTEM



**RAPID ACCESS  
MASS DECONTAMINATION PROTOCOL**

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**The Capitol Region MMRS**

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**Executive Summary**

**Introduction**

The Capitol Region Metropolitan Medical Response System [CR-MMRS] currently represents 32 communities in north central Connecticut, and includes 10 acute care health care facilities and approximately 100 first responder organizations comprised of local and state law enforcement agencies, fire departments, and EMS providers. Additionally within those communities there are 19 local health districts, as well as water and waste management agencies.

The complexities of this type of broad representation demand the standardization of equipment and training as it relates to region-wide mass decontamination practices. The purpose of this document is to recommend a concept of decontamination operations that enables interoperability of resources throughout the Capitol Region. This plan does not supercede any existing Emergency Action Plan or any decontamination procedures currently in place at healthcare facilities for the more detailed technical decontamination that might be employed as a base line pre-incident process prior to a large-scale event. Nor does it supercede the more traditional decontamination processes employed by any fire department when working at a HAZMAT scene to assure personnel safety and equipment decontamination.

Instead, the CR-MMRS Rapid Access Mass Decontamination Protocol provides a mechanism through which region-wide decontamination assets are identified, gaps in equipment and training are acknowledged, and existing resources are made available in an efficient and practical manner. Additionally, by standardizing both the type of equipment and the available training, and by setting an achievable standard for decontamination services for the entire region, we hope that the CR-MMRS Protocol contributes significantly to the goal we in the health community all share: to save lives under the most extreme circumstances.

## Assumptions

- Federal law enforcement and intelligence agencies warn of the extreme likelihood of future terrorist events utilizing weapons of mass destruction [WMD] and resulting in substantial casualties. Accidental events can also create a need for mass decontamination.
- Releases of chemical, radiological, or biological materials may occur. These releases may be accidental or intentional.
- An intentional WMD release in all likelihood will occur without advanced warning.
- An intentional WMD release/attack may not be recognized as a WMD or terrorist event. The first indications of an attack may be upon manifestation and recognition of the first medical symptoms occurring hours to days later.
- Physical control of the incident scene requires planning and advanced coordination by all first responders. The Incident Command / Management system using Unified Command is integral to the overall success of the operation.
- This plan provides guidance for a region-wide response with multiple local jurisdictions, utilizing state and federal resources.
- It is of the utmost importance to ensure that the healthcare system is alerted to these occurrences in a rapid and timely manner so that providers can implement procedures to effectively decontaminate exposed persons and limit additional contamination of others.
- The all-hazards approach to planning and implementing decontamination efforts has the greatest chance of providing a successful outcome
- Intentional WMD scenes may yield secondary devices meant to kill or incapacitate first responders, and the incident scene should be searched for such devices as soon as practical. However, lifesaving operations should not be delayed. Instead, first responders should remain vigilant to the possibility of such devices.
- As with any mass casualty incident, the potential for substantial loss of life is significant and survival is dependent on resource availability and efficiency of deployment.
- Large numbers of potentially contaminated individuals may self direct to Health Care Facilities in private vehicles. Plans must be in place for each facility addressing their specific needs for maintaining traffic control, and vehicle parking so as to avoid site congestion as best as possible.

## **ACKNOWLEDGEMENTS**

The Capitol Region MMRS wishes to express its sincerest appreciation and gratitude to Carmine Centrella, Chief of the Fire Service at the UConn Health Center / John Dempsey Hospital, for his leadership of the CR-MMRS Taskforce on Decontamination Protocols. Chief Centrella, one of the busiest people we know, managed to find the time and the passion to lead this group to the creation of an exceptional document that will serve for years as the standard for this important work.

Chief Centrella did not work alone. The members of the CR-MMRS Taskforce on Decontamination Protocols consisted of the following hard-working individuals:

Gary Allyn	Assistant Chief, West Hartford Fire Department
Kerry Flaherty	CT Military Department, Office of Emergency Management
Robert Fuller, MD	Emergency Department Director, UCHC/John Dempsey Hospital
Ronald I. Gross, MD	Associate Director of Traumatology, Hartford Hospital
Kenneth Loock	Director of Emergency Management, Town of East Hartford
Darlene Powell	CT Children's Medical Center
Brenda Murphy-Tenney	Chief Medical Officer, East Hartford Fire Department

We express our deepest appreciation to all.

# THE CR-MMRS RAPID ACCESS MASS DECONTAMINATION PROTOCOL

## A. Threats From Weapons of Mass Destruction

### I. Chemical Agents

Chemical agents commonly used as weapons of mass destruction fall into four categories: nerve agents, blister agents, blood agents, and choking agents. The dispersal of these agents can be by air, ingestion, or simple contact.

Most often, the release of chemical agents can be characterized by rapid symptom onset (minutes to hours) and may produce other environmental clues such as dead animals/insects, dead foliage, pungent odors and residues.

The three most common routes of exposure are inhalation, skin surface contact, and ocular contact.

*(See Appendix A)*

### II. Biological Agents

Biological agents, like chemical agents, can be dispersed in air, ingested, or spread through surface contact. Detection of a biological agent may not occur until days after the exposure when the first medical symptoms become manifest. The first indications of a release of a biological agent may be from a rise in the sick and dying within a community, among animals as well as humans. Without some type of forewarning, first responders may become easy prey to these agents. Given the generally delayed incubation periods and associated lack of timely detection of potential exposures, patient decontamination in most cases is not necessary.

*(See Appendix B)*

### III. Radiological Threats

Nuclear accidents, terrorist attacks using nuclear devices, or radiation dispersal devices (dirty bombs) pose significant threats to human life due to the release of ionized radiation, specifically from alpha and beta particles, gamma rays and neutrons. The capability to detect a radiological release is a must for all first responders. Time, shielding and distance have always been the best ways to guard against the threat of exposure from radiation.

Alpha particles can be stopped easily by a sheet of paper, but they can cause damage if the exposure is too long, or too close, with no shielding. The greatest danger from alpha particles results from ingestion, inhalation, or penetration through openings in the skin.

Beta particles penetrate deeper into the skin and move faster than alpha particles. If allowed to penetrate clothing, beta particles can cause injury to the skin and some radiation damage. As with alpha particles, the greater threat is through ingestion, inhalation, or penetration through openings in the skin. The external threat from beta radiation is to the skin and eyes.

The layers, or shielding, provided by a fire fighter's standard structural PPE (turnout gear) is considered adequate protection from both alpha and beta nuclear radiological hazards.

Gamma rays can easily penetrate and pass through the human body, being absorbed by tissues as it passes through the body. Without proper shielding (lead, or several feet of concrete), gamma rays pose a serious health hazard due to the effects of the radiation on internal organs and radiation sickness.

*(See Appendix C )*

## **B. EMERGENCY PREPAREDNESS**

### **I. Communications During an Emergency Event**

The detection and reporting of actual and perceived exposures requiring decontamination may occur in any of the following ways:

1. Reports to Public Safety Answering Point / Communications Centers of a real or perceived release.
2. Identification of a real or perceived release by Emergency Personnel arriving at an incident location.
3. Real or perceived exposures on the part of individual(s) who choose to seek medical assistance at hospitals without the intervention of public safety agencies.

Experience has shown that there are more perceived exposures than there are incidents with actual exposure to contaminants. However, delaying the activation of decontamination procedures until actual exposure has been confirmed will cause critical delays in system implementation, and in all likelihood lead to system failure. To address this concern, the CR-MMRS Decontamination Protocol utilizes two separate levels of alert: DECON STANDBY, and DECON ALERT.

#### **A. DECON ALERT**

1. The DECON ALERT mode is activated when a report has been made to a responsible authority that an exposure to a toxic contaminant may have taken place, but the number of exposures and/or the need for decontamination is unknown.
2. A DECON ALERT may be implemented by the following:
  - 911 PSAP or Public Safety Dispatch Center when a report is made by the public that an incident is perceived to have, or actually has, occurred. The decision to implement a DECON ALERT should be based on the nature of the release, reported symptoms, and the number of reported patients
  - On-scene Incident Commander when based on her evaluation of the scene
  - Any hospital Emergency Department, when a patient(s) presents to the Emergency Department reporting an exposure, or exhibiting signs and symptoms of an exposure. The decision to activate the DECON ALERT mode should be made by the attending physician, or by a triage or charge nurse.

3. When advised of a DECON ALERT, regional hospitals shall immediately check the status of their decontamination equipment and ensure that it is ready for immediate deployment and activation should the DECON ALERT evolve into a DECON STANDBY
4. Hospitals shall consider ambulance diversions if appropriate, increase security precautions / presence, and alter waiting room isolation practices.
5. Hospitals are responsible for advising any subsidiary healthcare facilities such as free- standing clinics, etc., that a DECON ALERT has been initiated.

## **B. DECON STANDBY**

1. The DECON STANDBY mode is implemented when an event has occurred requiring the decontamination of persons prior to either the provision of healthcare or release.
2. A DECON STANDBY may be implemented by the following:
  - The on-scene Incident Commander when based on his evaluation of the incident site.
  - Any hospital Emergency Department based on the number of patients presenting with signs and symptoms of exposure, along with other pertinent information such as multiple exposures occurring at the same location, and anticipating that other exposed persons exist in the community.
3. When advised of a DECON STANDBY, hospitals shall immediately initiate all appropriate actions to deploy and to staff their decontamination equipment and report when ready by telephone to the CMED/RICCS Center. This includes deployment of any first responders who may be responsible for the decontamination processes.
4. Hospitals shall immediately move to a lock-down state with a single point of entry and egress to avoid contamination of the facility.
5. Hospitals are responsible for advising any subsidiary healthcare facilities such as free-standing clinics, etc., that a DECON STANDBY has been initiated.

## **C. DECON INITIATION NOTIFICATION**

1. Once Decontamination has been initiated at any health care facility it shall be reported to the CMED/RICCS Center.
2. RICCS shall initiate a statewide notification using the MEDNET system and Capitol Region notification using the Intercity Radio frequency.

## II. The CREPC Regional Emergency Disaster (RED) Plan Alert System

### A. Incident / Event Status Levels

1. Based on the Connecticut Emergency Preparedness System, the following incident/event status levels have been developed for use in the CREPC RED Plan by all ESF's and supporting agencies:
  - Level One – Single agency/ single community incident
  - Level Two – Standard mutual-aid event
  - Level Three – Regional resources activated through the CREPC RED Plan
  - Level Four – Regional and state resources activated
  - Level Five – Regional, state, and federal resources activated
  
2. Following the RED Plan activation process, any Incident Commander can institute a RED Plan Level 3 response by contacting the Regional Incident Communications and Coordination System (RICCS) / CMED North Central on the intercity radio network. Upon notification the following personnel will be notified, first by the INTERCITY RADIO NETWORK, second by paging, and last by telephone:
  - i. ESF-2 Coordinators
  - ii. CP-8, the mobile command post from the Town of Newington. This notification shall be done first by radio, on Intercity, or by calling 860-666-8445 [the emergency dispatch center]
  - iii. ESF-8 Coordinators, including CR-MMRS
  - iv. ESF-16 (Law Enforcement) and the RID (Regional Incident Dispatchers) with Farmington Dispatch. This notification will be done first by radio, on Intercity, or by calling 673-2525 [the emergency dispatch center]
    - Farmington Dispatch will make the radio notification on the Police Hotline and both RAFS radio frequencies
  - v. Head of the ESF-5 Planning and Information shall be notified
  - vi. Notify the State Office of Emergency Management by phone 860-566-3180
  - vii. Notify the State Police Message Center for possible activation of the ITAC radio system. At this time call 800-842-0200
  
3. Once a Level Three Response has been requested and activated, the following information from the incident site is transmitted to RICCS:
  - Type of Incident [Fire, EMS, Hazmat, or Law Enforcement]
  - Location of the incident
  - Contact person
  - Location of the staging area
  - Requesting person and authority
  - Contact radio frequency

## B. Notification Processes

Once a determination has been made that there is need of a mass decontamination operation, the Incident Commander shall initiate a *Rapid Access Mass Decontamination Plan* using available resources and practices as described in this document:

1. The Incident Commander shall request an appropriate number of state Decontamination Trailers for the incident site, as well as the deployment of the remaining trailers to those area hospitals most likely to be impacted by the arrival of contaminated individuals. The remaining region will be placed on a Decontamination Alert.
2. If this is a suspected intentional release or a forewarned event, the Incident Commander shall request the proper notifications in accordance with the State of Connecticut Consequence Management Guide for Deliberately Caused Incidents Involving Chemical Agents, promulgated by the Office of Emergency Management.

## C. Emergency Support Functions

The Capital Region MMRS endorses the use of Emergency Support Functions in accordance with the Capital Region RED Plan. The Regional ESFs provide the support needed to sustain a larger operation. In the event of a need for Emergency Mass Decontamination the following support could be expected.

**R-ESF 1 Transportation** – Coordinates the planning & movement of large numbers of individuals other than ambulance services.

**R-ESF 2 Communications** – Facilitates coordination & communication of information. Establishes temporary communications & technical communication procedures between jurisdictions. Coordinates the hardware of communication interoperability.

**R-ESF 3 Public Works & Engineering** - Develop and implement a system of resources and response capability to handle regional emergencies concerning water supply, wastewater, solid waste, and debris management during and after a potential or actual regional emergency.

**R-ESF 4 Fire Services** - Provides for the rapid mobilization, deployment, and utilization of regional fire resources during a major disaster in the capitol region.

**R-ESF 5 Information and Planning** - Facilitates the collection, processing, and dissemination of information about a potential or actual regional emergency R-ESF 5 is the information and planning element of the regional communication and coordination effort. The function is executed through the Regional Incident Communication and Coordination System (RICCS/CMED).

**R-ESF 6 Mass Care** – Coordinates efforts to provide sheltering, & feeding in the event of a catastrophic event. Organizational structure designed to monitor, coordinate and support providers of mass care services including the American Red Cross and

government agencies, federal, state or local. R-ESF 6 should not be thought of as a direct provider of mass care services.

**R-ESF 7 Resource Support** - Facilitates communication and coordination among regional jurisdictions and agencies concerning emergency resource issues and activities during a major disaster in the capitol region.

**R-ESF 8 Health and Medical Services** - Facilitates communication, cooperation, and coordination among local municipalities and supporting agencies concerning regional health and medical services issues and activities in relation to a regional emergency. The Capital Region- MMRS is a functional component of R-ESF 8.

**R-ESF 9 Urban Search and Rescue (USAR)** - Facilitates communication and coordination concerning technical rescue capabilities during a major disaster in the capitol region.

**R-ESF 10 Hazardous Materials** – Provides for the rapid mobilization, deployment, and utilization of regional hazardous materials resources during a major disaster in the capitol region.

**R-ESF 11 Food**- Underdevelopment

**R-ESF 12 Energy**- Underdevelopment

**ESF 13 Military**- This annex is not used on a regional basis

**R-ESF 14 Media** - Currently under final development, but would be responsible for maintaining a relationship with the media during a regional event.

**R-ESF 15 Donations & Volunteer Services** - Under final development, but would be responsible for the coordination of donations and public volunteers during a regional event.

**R-ESF 16 Law Enforcement** - Enforces the law, control traffic, protect the citizens, and provide for the safety and well-being of the public during a major disaster in the Capitol Region. In the event of Mass Decontamination needs R-ESF 16 would be responsible for crowd control and site security.

**R-ESF 17 Animal Protection** - Under development

**D. Notification Algorithm** – How first notifications are made (See Appendix D)

### **III. Decontamination Basics**

The CR- MMRS Rapid Access Mass Decontamination Protocol describes three distinct scenarios for decontamination within the CREPC region:

1. *Crowd Decontamination*: Initial emergency decontamination at the incident site
2. *Multi-Corridor Decontamination*: A more formalized decontamination process at the incident site

3. *Combination of both crowd and corridor decontamination*: Decontamination at the regional hospitals/ healthcare facilities

### ***Dry vs. Wet Decontamination***

The simple act of disrobement followed by a good washing of the hands and face can resolve much of the concern for contamination in ambulatory persons with no symptoms. This process of *dry decontamination* should not be discounted as a viable option depending on agent specificity and the frequent need to deal with large numbers of the “worried well”. *Wet decontamination*, on the other hand, requires a 2 to 4 stage process of repeated wash/rinse.

The type of decontamination process chosen should be based on the following considerations:

1. The physical state of the contaminant: Solids and liquids require a more aggressive decontamination approach. In contrast, gases or vapors usually have a minimal residual contaminating effect.
2. Water solubility: If the agent is water-soluble, a simple flushing or wash/rinse is very effective. If the material is not water-soluble, or not as easily removed by water, then some form of emulsification is required.
3. Vapor Pressure: If the vapor pressure is high enough and quickly evaporates then it demonstrates minimal persistency vs. a lower vapor density agent that can remain a contaminant for days.

### **Incident Site Decontamination**

1. Decontamination at or near the initial incident site is the preferred method of operation. **The quicker the decontamination process starts the better.**
2. On-site initial decontamination of large crowds is most easily established by fire department first responders following Rapid Access Mass Emergency Decontamination Guidelines that include:
  - a. Establishing decontamination zones uphill and upwind from the event site
  - b. Deployment of multiple hand lines or staging of apparatus curbside to curbside, with nozzles attached directly to outlets to form side to side showers.
  - c. Ladder or truck positioned to form top-down shower.
  - d. Establishing a containment area for waste water [resource-dependent].

The initial decontamination process consists of a generalized hosing/wetting of a controlled crowd as they pass in a line toward either the second stage or a multi-corridor process, e.g., a decon trailer, or a makeshift fire department corridor. Disrobement is strongly encouraged, especially in the face of a liquid contaminant. Outer clothing layers obviously carry the most contaminant especially if the contaminant is a dry substance or gas.

Rapid deployment of standardized decontamination trailers situated strategically throughout the state is instrumental in achieving decontamination in a controlled environment that takes weather and modesty into consideration. The “Decon Trailers” provide a definitive decontamination process for both females and males, and for non-ambulatory individuals, through a multi-corridor design. The trailers can be established at or near the incident site, or as strategically located decontamination stations in a community or region.

## **Hospital-Based Decontamination**

Statistics indicate that 80% of persons arriving at a hospital after a large-scale disastrous event travel via private vehicles. This means that 80% of persons arrive at hospitals following a disaster without having been screened for possible decontamination. Hospitals must prepare to meet this potential threat in accordance with JCAHO Environment of Care Standard EC 1.4. This comprehensive standard requires that hospitals have plans in place for performing hazard analysis, event mitigation, community and hospital-wide coordination, establishment of alternate care sites, and facility evacuations.

### **Emergency Action Plans**

Given the very real potential of losing a health care facility due to large numbers of possibly contaminated individuals arriving at a facility in private vehicles, each health care facility shall develop an Emergency Action Plan that effectively addresses issues including traffic control, parking of vehicles, maintaining open access for first responders, and event termination procedures. Coordination with local law enforcement and the Capitol Region ESF-16 is essential to effective planning for these contingencies.

Additionally, each facility shall develop staging areas for arriving resources such as the CT Mass Decontamination Units and report the location of those areas to the Capitol Region MMRS and to the CT State Office of Emergency Management. The staging areas shall be located as far away from hospital entrances and traffic patterns as possible, while maintaining easy access to the emergency departments for transport of decontaminated patients requiring hospitalization.

**A.C.I.D. Protocol:** The most important element for protection of a hospital in this type of a situation is to perform some form of a lock-down or denial of entry. Upon recognizing the probability that contaminated persons may be entering the facility, the facility should activate the *A.C.I.D. Protocol*.

<i>Assess/Activate:</i>	Assess threat to facility / Activate Emergency Action Plan
<i>Call:</i>	Call appropriate emergency number
<i>Isolate:</i>	Isolate persons / Redirect to decontamination / secure area
<i>Decontaminate:</i>	Decontaminate persons per facility Emergency Action Plan

The A.C.I.D. Protocol is a continuum advancing from initial assessment, through threat and product identification, resource needs and deployment, decontamination efficacy, patient triage and finally termination of decontamination efforts.

### **Hospital Decontamination Strike Forces**

The CR-MMRS Rapid Access Mass Decontamination Protocol recommends that each hospital shall develop a hospital decontamination response team or “Strike Force” comprised of a cross-section of hospital employees including facilities maintenance staff, safety personnel, and clinical staff, with at least one trained team member available on-site 24 hours a day. Upon activation, the hospital strike force shall activate the available decontamination equipment and begin the decontamination process. For those facilities at which only one

person might be available, that person shall serve as the liaison with the first responders summoned to perform the actual decontamination.

### **Hospital Baseline Pre-Incident Decontamination Goals**

Prior to activation of the CR-MMRS Rapid Access Mass Decontamination Protocol, each hospital shall have an innate capacity to decontaminate a relatively small and manageable number of individuals. This number, expressed as patients/hour, is defined for each hospital through the use of a formula based on the annual number of patient visits to the Emergency Department of that facility:

$$\frac{\text{Annual Number of ED Visits}}{1000} = \text{Patients Per Hour Capacity}$$

*Example: Hospital A sees 15,000 patients per year in its Emergency Department. Based upon the CR-MMRS recommendation, that hospital shall have the capacity to decontaminate 15 patients per hour utilizing its own intrinsic resources.*

Should Hospital A determine that the demand for decontamination services has escalated and will overwhelm its own resources, the hospital may then activate the CREPC RED Plan by calling the RICCS/CMED communications system. By activating the RED Plan the hospital and the Capital Region will have access to the appropriate resources for incident mitigation as it pertains to decontamination practices. Notification to the PSAP serving that locale should have already taken place summoning first responders for assistance.

### **Activation of The CREPC RED Plan**

1. Upon the first indication that a region-wide event may be occurring, or that the individual hospital's capacity for provision of decontamination services will be exceeded, an alert notification to other facilities via the RICCS/CMED MEDNET system shall be made.
2. Upon notification from RICCS, all CREPC regional healthcare facilities shall stand up their appropriate plans for facility site control and decontamination.
3. Contaminated facilities shall follow regional protocols for hospital diversion as needed for proper patient care.
4. Hospital-based mass decontamination should take place as far away from its doors as logistically possible. Each hospital shall supply in advance to the CR- MMRS and State OEM the desired / predetermined location for the arriving Decontamination Trailers.
5. In addition to securing the actual facility, as large an area as possible around the facility shall be cordoned off and secured. These cordoned-off areas allow the establishment of a multi-corridor decontamination process, alternative treatment sites, and possible treat-and-release protocols being employed. This latter process saves the hospital's services for acute admissions. Hospitals should have in place plans for

security, and site control of their facility using their intrinsic security system and local Law Enforcement.

(See Appendix F for Hospital-Based Self-Decontamination Instructions)

(See Appendix G Hospital-Based Algorithm)

Within thirty [30] minutes of activation of the CREPC RED Plan and the CR-MMRS Decontamination Protocol, each hospital or each affected area shall have the capability to decontaminate 250 persons per hour. Hospital-based mass decontamination shall follow the same concepts as incident- site decontamination, e.g., the use of a repeated wash / rinse process. Staffing shall reflect a mixture of hospital staff and local first responders to meet the needs of the given situation.

State-deployed decontamination trailers have the capacity to decontaminate approximately 100 – 120 individuals per hour. Assuming a single, localized contamination incident, these trailers can provide decontamination services at a rate in excess of 2,000 individuals per hour within 2 hours of activation.

Based on the efficient deployment of the state’s decon trailers in a timely fashion, The CR- MMRS Rapid Access Mass Decontamination Protocol sets a standard that, within 90 minutes of RED Plan activation, any single hospital or local target area shall reach and maintain a target rate of decontamination of 1,000 persons per hour for 72 consecutive hours. To reach this target decon rate, the 10 closest decontamination trailers shall be dispatched to the incident scene for activation within 90 minutes of RED Plan activation. The remaining 10 decontamination trailers shall be dispatched to the hospitals most likely to be impacted by the arrival of contaminated persons.

The following trailers are expected to be located in the CREPC area:

- |                                   |  |
|-----------------------------------|--|
| 1. Hartford /East Hartford Region | 5. CT Department of Environment Protection |
| 2. UConn Health Center            | 6. New Britain                             |
| 3. Bradley International Airport  | 7. Waterbury                               |
| 4. Torrington                     | 8. Capitol Region HazMat Team              |

These eight (8) trailers are to be fully operational within the first 90 minutes following activation of the CR-MMRS Rapid Access Mass Decontamination Protocol.

Other trailers are to be located in the following communities:

- |                      |                        |
|----------------------|------------------------|
| 9. Groton-New London | 10. Mashantucket Tribe |
| 11. Bridgeport       | 12. Mohegan Tribe      |
| 13. Stamford         | 14. Norwalk            |
| 15. Danbury          | 16. New Haven          |

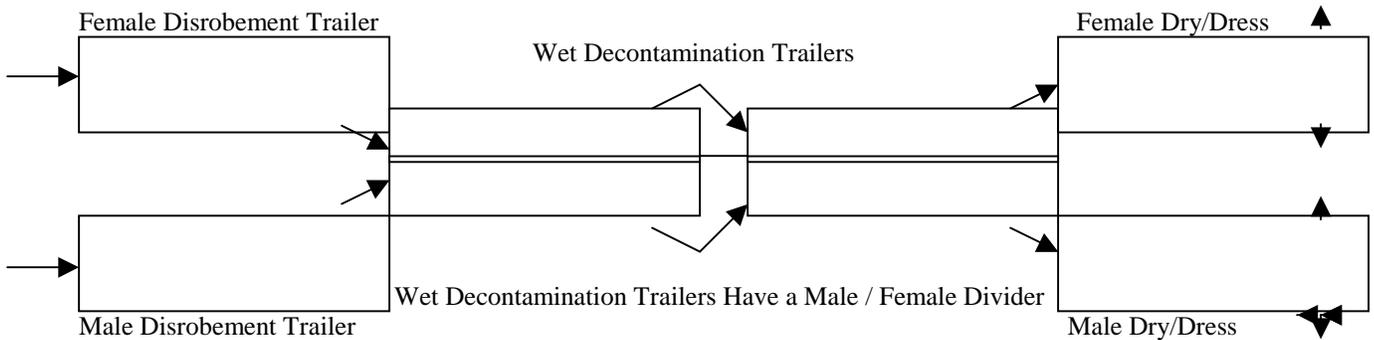
There are four additional state decon trailers that will be deployed with the regional HazMat teams throughout the state. Each of the last twelve trailers is available for deployment in the CREPC area within four hours of activation of the CR-MMRS Decontamination Protocol.

The overall number of trailers to be deployed at an event is dependent upon the estimated number of contaminated persons and the nature of the contaminant.

Scenarios to be considered when calculating how many decontamination trailers may be needed are:

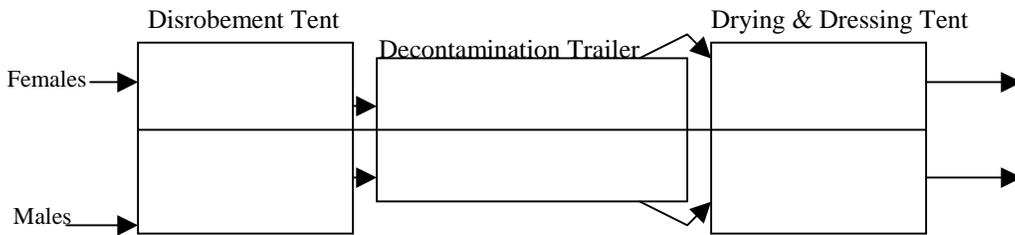
- a. Persistent contaminant requiring a longer wash-and-rinse time
- b. Providing quick access to individuals in need of decontamination
- c. Choke points at the entry and exit ways of the trailers

*Fig. 1: Suggested Decontamination Trailer Configuration for Above Scenario*



*With the Male/Female divider in place, one trailer can be used in each case for disrobement and dressing. Additionally, mass transit buses or tents can be employed for personal disrobement and dressing areas. Buses can be configured perpendicular to the decontamination trailers, and tents can be set up at entry and exit ways.*

*Fig. 2: Possible configuration of tents and Decontamination Trailer to alleviate congestion at entry and exit ways and allowing for privacy during disrobement, and dressing.*



## **CR-MMRS RAPID ACCESS MASS DECON GUIDELINES**

### **RECOMMENDED PROCEDURES FOR USING FIRE FIGHTING RESOURCES**

#### **1. OBJECTIVES**

The Rapid Access Mass Decontamination program was developed to enable local fire departments to gain control of mass-casualty contamination incidents by initiating immediate definitive measures. Upon completion of this program, fire departments will be able to reduce or prevent the effects of chemical agent contamination by rapid gross decontamination. By properly applying these procedures, fire departments also will be able to prevent cross-contamination of emergency personnel.

#### **2. BENCHMARKS**

Prior to, or concurrent with, the establishment of Rapid Access Mass Decon measures, *actions not specifically covered in this protocol need to be carried out*. Such measures should be conducted based upon established local procedures and or accepted practices. These actions include the following:

- ◆ *Identify event as a chemical/ biological incident* –a relatively high suspicion exists that a chemical or biological product has been released in such a manner as to contaminate persons.
- ◆ *Establish control zones* – set up standard hazardous materials control zones; hot, warm and cold must be established and entry denied to unprotected personnel.
- ◆ *Initiate appropriate responses* - (State HazMat - Police - EMS - etc.) – resources commensurate with incident requirements should be summoned based upon local procedures
- ◆ *Determine the potential number of persons contaminated* – attempt to ascertain the maximum number of persons requiring decontamination, and arrange for follow-up medical attention as indicated.

### 3. INDICATIONS FOR USE

The Rapid Access Mass Decontamination System is intended for specific circumstances involving large numbers of contaminated persons. It should be considered for use and incorporated into local procedures for large-scale chemical exposure from industrial or transportation accident involving chemicals, or for the intentional release of chemical or biological agents. In the absence of any other decon capability, however, this system can be employed for one person. The following conditions are considered as appropriate guidelines for implementation of the Rapid Access Mass Decon procedures:

- 8 - 10 persons [or more]
- Who are ambulatory and self-extricated
- Who are suspected to be contaminated
- Where existing local decon resources are expected to be exceeded

### 4. ADDITIONAL CONSIDERATIONS

Once Rapid Access Mass Decon has been deployed, the following **ongoing needs** should be managed:

- Adequate personnel – Consider the need for relief following use of SCBA. While substantial numbers of persons can be passed through the system quickly, the rate at which those persons arrive at the Rapid Access Mass Decon location may require extended periods of operation.
- Adequate air supply - Consider the need to re-supply SCBA air tanks
- Adequate water supply- Estimated water flow for this operation is 700 – 1000 GPM per mass decon set-up.
- Terrain – Rapid Access Mass Decon is deployed in the warm zone of the incident. Hence it is necessary to consider its location relative to the hot zone to prevent the encroachment of contamination into the decon area. Also, as part of a larger operation, attention must be paid to the effect of decon location and runoff upon other aspects of the operation, such as medical care, staging and incident facilities. Generally, the following rules for selection of terrain should be applied:
  - *Wind Direction* – Up-wind so that the wind blows from decon toward the hot zone
  - *Uphill* – This is a consideration for both the placement of the decon as it relates to the hot zone and as it relates to the placement of post-decon collection points and treatment areas
  - *Runoff* – The EPA has stated that, in accordance with the limits of liability in CERCLA, the run-off is not a primary concern. However, run-off is a definite consideration in the placement of post-decon collection and treatment areas
  - *Warmth and shelter for victims* – Regardless of the time of year, decontaminated victims will need to be sheltered and warmed after decon in order to reduce the severity of illness or injury from cold and to maintain control over the incident

While substantial numbers of persons can be passed through the system quickly, the rate at which those persons arrive at the Rapid Access Mass Decon location may require extended periods of operation.

## **5. LEGAL ISSUES OF ENFORCING DECONTAMINATION**

The legal authority to require decontamination is unclear at best. Based upon related issues such as medical care and evacuation, it is believed that emergency personnel cannot force a victim to undergo decontamination procedures. CR-MMRS recommends the following procedure in the event of a refusal:

1. *If a potentially contaminated victim refuses decon, assess the risk posed to others by cross-contamination.*
2. *Record the names and addresses if possible of anyone refusing decon. This tracking information may be needed later if the severity of contamination is found to warrant further care, or to warn and protect responders if these patients later request medical assistance.*
3. *Names and addresses shall be forwarded expeditiously to the local health director for follow-up.*

## **6. CONTAMINATION VS. EXPOSURE**

There is a significant difference between *contamination* and *exposure*. Consider this comparison:

*From contamination:*

- Product is transferred or deposited on person and/or on clothing
- Dose and effect increase as long as contaminant remains
- Cross-contamination may be possible
- Off-gassing may occur

*From exposure only:*

- No product is transferred
- Dose is discontinued after exposure ends, but effects may continue
- No cross contamination or off-gassing hazard exists except with biologics

## **7. RAPID ACCESS MASS DECON FEATURES**

While *technical decontamination* can be accomplished by many local fire departments and is considered a hazardous materials first responder operational-level skill, most departments lack the specialized equipment to manage technical decontamination for a large number of persons. The features and advantages of the Rapid Access Mass Decon method are listed below:

- Can be accomplished by any fire department without special equipment
- Functions through low water pressure (30 - 50 PSI) deluge maze
- Clothing is not necessarily removed
- Run-off water is of minimal concern

The combination of simplicity, lack of specialized equipment and training needed, and the resulting speed of delivery, make this method a truly viable “first response” to mass casualty contamination incidents.

## 9. DECISION / ACTION SEQUENCE FOR RAPID ACCESS MASS DECON

### A. 2 ENGINE RESPONSE-ACTION SEQUENCE:

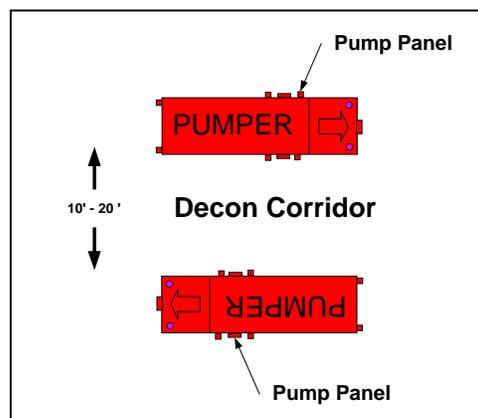
The following procedures detail the activation of the Rapid Access Mass Decon system assuming a first response of two (2) engine companies. While this response is minimal, Rapid Access Mass Decon can be applied to nearly any combination of this response. It is also possible to utilize deck guns and additional hand lines to achieve the desired water flow and pattern. More important than the precise combination of responding apparatus, the steps taken to initiate the system will assure that the objectives of control and decontamination are achieved.

#### Decision/Action Flow Chart

*Following these steps will lead to a coordinated and controlled response to a mass-casualty contamination incident:*

- Identify need for decontamination procedure
- Communicate intent
  - Advise victims and responders of your intent to establish decontamination at the site
- Establish a plan
  - Identify locations to assemble victims prior to decon and the locations for decon
- Communicate your plan
  - Define and identify hot/warm/cool zones and the decon process. Inform victims and emergency personnel
- Assemble victims
  - Contain and control victims to prevent dispersion or re-entry
- Set-up decontamination
- Initiate decontamination

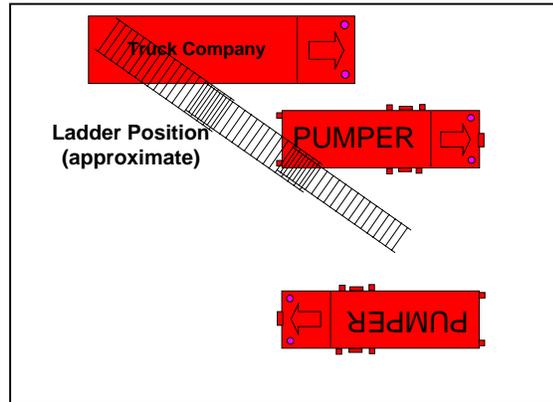
Fig. 2: Suggested two-engine response configuration:



## B. 2 ENGINES & 1 LADDER SET-UP POSITION OF APPARATUS

Using the response of two engines and one ladder, the apparatus can be positioned to establish the decontamination corridor and provide the least possible exposure of fire fighters to victims.

- Position apparatus to create a corridor, operator panels to the outside – Engine companies should be positioned facing in opposite directions, 20' – 30' apart to create

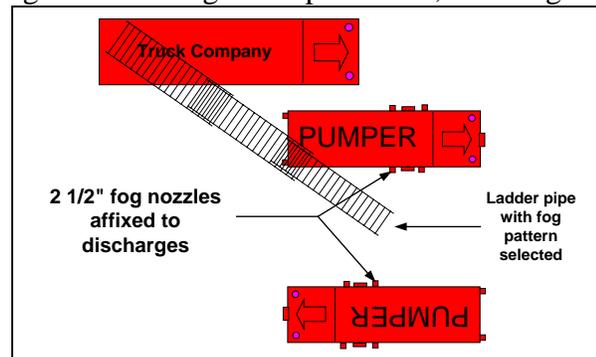


a corridor with the pump operator panel to the outside of the corridor

- Limit exposure of personnel and equipment – The ladder company should be positioned on the exit side of the corridor or, if space allows, on the outside of one of the engine companies
- All personnel operating within or forward of corridor must be in FFPE – pump operators, fire fighters on hand lines and those serving as entry or exit guides should be in full fire fighter protective ensemble including SCBA

## C. CREATE THE WASH PATTERN

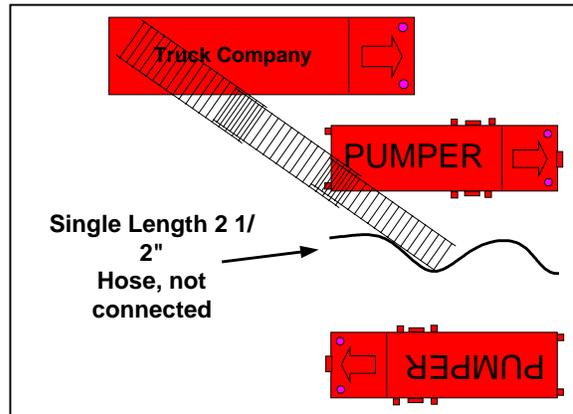
- Affix nozzles to discharge and/or use deck gun – Use 2 1/2" fog nozzle attached directly to the side-mounted discharge on each engine. If preferable, a deck gun may be used, but may require greater distance between the engines to achieve proper coverage



- Use wide fog patterns that intersect between apparatus – the pattern should cover as much of the decon corridor as possible. Be certain that the patterns of both fixed nozzles will overlap in the middle of the corridor
- Position ladder pipe to over-spray the corridor – Position the ladder pipe over the center of the corridor and adjust the pattern so as to cover as much of the corridor as possible. Remember, pump pressure will be below 50 psi, so normal patterns will be reduced.

#### D. ESTABLISH THE DECON PATH

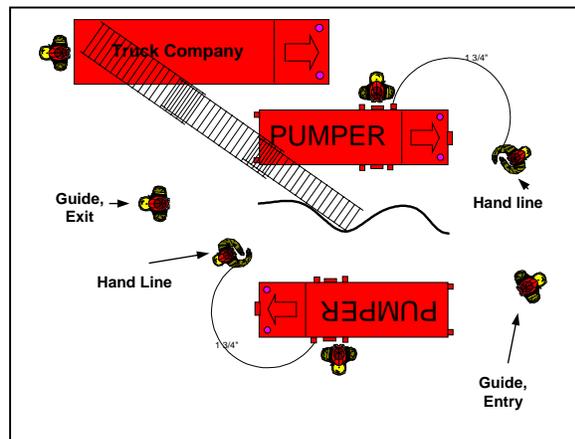
- Use a section of hose to create an “S” pattern in the corridor – A single section of hose should be laid out as a path for victims to follow. This path should make a full and wide “S” shape.
- Pattern should cause victims to have maximum 360°



exposure to water spray – The 360° coverage is necessary to achieve the best possible decontamination. This will also slow the passage of victims to insure that they are in the pattern long enough to be decontaminated.

#### E. POSITION PERSONNEL

- Position a hand-line at each end of the corridor diagonally across from each other – The hand lines fill gaps in the pattern and can also be used to concentrate a wash on persons that are not following the hose line.
- Position a “guide” at each end of the corridor to direct victims in and out of decon – A guide should be placed at the entrance to direct victims into decon. This direction will be achieved largely using hand signals, as the guide will be in FFPE with SCBA. A second guide must be placed at the exit to direct victims to triage or holding areas. (See Appendix E for Decontamination Direction)



#### F. BEGIN RAPID ACCESS MASS DECON

- Once all lines and appliances have been charged, observe and adjust pattern and flow to insure full coverage of the corridor. Hand-lines can be moved or added to cover any “holes” in the pattern and eventually replaced with monitors as needed. Direct victims into the corridor and instruct them to follow the hose to the other end.
- Decontamination for chemical agents can be further facilitated by the application of PPV Fans blowing air across ambulatory persons waiting for water-based decontamination. *This does not apply to biological or radiological contamination.*

## G. GUIDE AND TRIAGE

- Maintain control of victims exiting the corridor and direct them to triage.
- Establish a triage point and segregate exposed versus contaminated versus affected patients for further treatment and decontamination as needed.
- If possible, control run-off to prevent possible environmental consequences and secondary contamination. (*See Appendix I: Rapid Triage for Exposed Patients*)

## H. RELIEF PROCEDURES

Though the Rapid Access Mass Decon system provides rapid processing of victims, all victims will not arrive at the decontamination site simultaneously. This may require a prolonged operation of the decon corridor. Provisions must be made to relieve personnel “on air” with sufficient opportunity for them to undergo decontamination, retreat to the cold zone, and doff their SCBA. Activation of the CREPC RED Plan will summon appropriate resources to assist the affected jurisdictions.

- Monitor on-air time – Personnel shall be relieved with at least five (5) minutes of air remaining.
- Adequate personnel for relief – Have sufficient personnel ready and in FFPE and SCBA to replace personnel on the line before they are due to rotate out.
- Assign personnel to positions – Relief personnel should know where they are going in the decon corridor before entering.
- Deploy relief personnel – Relief personnel shall be directed where possible to access their assigned positions by walking around the outside of the corridor
- Relieve personnel – A “hand-off” shall take place between personnel on the line and relief personnel to ensure continuity
- Decon-relieved personnel – Relieved personnel shall fall into line and pass through the Rapid Mass Decon line. Because they have not entered the hot zone, and have not had direct contact with victims, there should be no contamination. This step of decon serves only as an absolute precaution.
- Relieved personnel to rehab as indicated – Personnel who have been relieved and undergone decontamination should be rehabbed, have their air bottle replaced and stand by to relieve their relief, unless other duties are assigned. Their FFPE can continue to be worn.

## I. SUMMARY

While effective mass-casualty decontamination has been placed at the forefront of planning because of concern for weapons of mass destruction, the principles and procedures developed here serve to increase our capacity for other emergencies as well, as long as they are utilized appropriately and viewed as a part of a larger response system. Keep in mind the limitations of the Rapid Access Mass Decontamination System as listed below:

- Designed for emergency decon of large numbers of victims
- Not a substitute for HazMat team response
- Must establish and maintain control of victims and responders

Additionally, fire resource configurations for Rapid Access Mass Decontamination can take other forms not illustrated here. The same concepts can be employed with single apparatus companies using multiple hand lines or monitors.

## Special Decontamination Considerations

### Cold Weather Decontamination

The mean temperature most comfortable for standard outdoor decontamination processes is approximately 65° F. Below this temperature, persons may be reluctant to follow the standard process.

If the outdoor temperature is between 35° F to 65° F, then moving persons directly to a warmer environment ASAP after outdoor decontamination is critical. These areas can be decontamination trailers, strategically deployed heated tents, office buildings, hospitals, or shelters.

If the temperature is below 35°F, attempts shall be made at indoor decontamination, using decontamination trailers, indoor shower facilities, car washes, or swimming pools. *An Olympic-sized pool can decontaminate approximately 800,000 persons contaminated with VX gas before the pool will show any effects of the contaminant. As there are other associated risks, this option requires very close supervision.*

During colder weather the more probable scenario of large numbers of persons exposed to a possible contaminate in the Capital Region would take place “inside” of a building whether it be an office building, mall, or other public venue. Larger buildings with multi-zone HVAC systems offer the ability to move persons to a portion of the building that as of yet may be unaffected by the contaminant where it may be possible to initiate decontamination or screening efforts indoors. This option requires pre-planning & coordination by the local fire & law enforcement jurisdictions with the responsible facility staff. The facility staff would be responsible for reconfiguring the HVAC system so as to avoid the spread of the contaminant to the area of operation, and to increase fresh air supply to the operational area. This option also mandates extensive air monitoring to assure operational viability. If a clean air environment can not be maintained then movement to the outdoors would be indicated.

**PPV Fans** - For gaseous substances such as anhydrous ammonia and chlorine, persons can be thoroughly decontaminated using Positive Pressure Ventilation Fans set up approximately 10 - 15 feet away from the individuals being deconned.

**Automatic Sprinkler Systems** - Use one or more sprinkler heads to decontaminate persons moving into a building or out of a contaminated building.

**Wetting a Person in Cold Weather** – Cold-weather decontamination shall be done incrementally vs. having the person immediately drenched. Special attention must be paid to

cardiac patients and the elderly if there is absolutely no alternative to outdoor wet decontamination. If no indoor facilities can be accessed, the following Dry Decontamination procedures can be employed:

1. Remove outer clothing and blot with paper towels
2. Persons can assist each other
3. Transport to warm area for wet decontamination

**Soap** - Baby shampoo is the most effective soap agent for decontamination purposes at this time. Mixing of approximately 8 oz. of soap with water in a standard 2.5-gallon garden sprayer should yield an effective soaping agent.

**Sea / Salt Water** - The National Institute of Standards and Technology reports that, due to its *ph* level, sea water has been proven to be a more effective wetting / decontamination agent than “normal” water.

**Waste Water Runoff / Disposal** - Decontamination shall not be delayed while setting up appropriate procedures for waste- water containment, as the saving of lives is your primary function. However, once adequate containment resources are available, the following Connecticut Department of Environmental Protection policy shall be followed:

*In the event of an emergency response to a possible anthrax or other biological agent contamination incident, emergency personnel often utilize water and disinfection agents to wash down protective equipment, including but not limited to containment suits. For the purpose of protecting waters of the state from pollution, the following procedures should be followed at each site where such activities occur. **These procedures apply only to instances of cleanup activities where it has been verified through appropriate testing that no anthrax or other biological agent is present. Where testing confirms that anthrax or other biological agents are present, wash waters must be transported by licensed waste hauler.***

*Due to the toxic nature of chlorine and other disinfecting agents which may be used, and the need to minimize the release of any potential pathogens, every possible precaution must be taken to effectively contain all wash waters generated from these procedures in order to prevent any releases to surface waters or groundwater used for drinking.*

**Procedures for Disposal of Cleanup Wash Waters Verified Not Contaminated With Biological Agents:**

- **Minimize Use**
  - Use only those quantities of bleach and water that are needed for full cleanup.
- **Containment**
  - During decontamination activities, contain all wash water within a watertight container away from any storm drain, catch basin, stream, swale or other direct access to surface water.
- **Disposal**
  - Carefully dispose of the wastewater **only to a municipal sanitary sewer or via a waste hauler** licensed to transport the waste. [A list of certified

haulers can be obtained from the Department of Environmental Protection, Waste Management Bureau, Engineering and Enforcement Division at (860) 424-3023].

## Personal Protective Equipment and Training Considerations

### I. Emergency Scene – First Responders

Operations conducted at any chemical, biological, or radiation release event requires the appropriate personal protective equipment [PPE] when operating within a Hot or Exclusionary Zone. Decontamination procedures for traditional HAZMAT operations take place in the warm zone. In contrast, Rapid Access Mass Decontamination usually occurs at a Hot level and must be established quickly. As with any hazardous operation, the first step in personnel protection is to establish decontamination operations upwind and uphill from the incident itself.

Responder Level of Protection	Responder Training
<p><b>Minimum PPE Levels</b></p> <ul style="list-style-type: none"> <li>• No direct contact with agent</li> <li>• Chemical known and low risk contaminant</li> <li>• No contact with persons being decontaminated</li> <li>• Persons being decontaminated are ambulatory and can understand self-decontamination instructions.</li> </ul> <p><b>PPE Level:</b> D Structural turn out gear</p> <p><b>Respiratory Protection:</b> SCBA / Air Purifying Respirator</p>	<p>First Responders Operations Level</p>
<p><b>Intermediate Protection</b></p> <ul style="list-style-type: none"> <li>• Some contact or exposure to contaminated individuals is anticipated</li> <li>• Persons ambulatory but may need assistance</li> <li>• Chemical is known AND is a low-risk contaminant</li> </ul> <p><b>PPE Level:</b> D or C [agent-dependent]</p> <p><b>Respiratory Protection:</b> SCBA / Air Purifying Respirator</p>	<p>First Responders Operations Level</p>
<p><b>Advanced Protection</b></p> <ul style="list-style-type: none"> <li>• Actual contact or exposure is expected</li> <li>• Unknown agent, AND/OR high risk contaminant</li> <li>• Non-ambulatory persons needing decontamination</li> </ul> <p><b>PPE Level:</b> Level B Chemical protection</p> <p><b>Respiratory Protection:</b> SCBA, or Supplied Air</p>	<p>First Responder Operational Level – Minimum Recommended EPA HAZMAT Technician Level or higher</p>

## PPE for the Hospital Setting

Responder Level of Protection	Personal Protective Equipment	Training
<p><b>Minimum Protection</b></p> <p>These PPE considerations offer minimal protection acting mainly as a liquid/splash barrier for the following:</p> <ul style="list-style-type: none"> <li>• No staff contact or exposure is anticipated</li> <li>• Chemical is known and is low risk contaminant</li> </ul> <p>Used with exterior decontamination of ambulatory patients who can understand self decontamination instructions</p>	<p><b>PPE Level: D</b></p> <p>Splash protection:</p> <ul style="list-style-type: none"> <li>• Full face shield</li> <li>• Gloves</li> <li>• Water repelling gown</li> <li>• Rubber boots</li> <li>• Hood or hair cover</li> </ul> <p><b>Respiratory Protection:</b> Not needed or HEPA mask</p>	<p><b>See Training Addendum</b></p>
<p><b>Intermediate Protection</b></p> <p>These PPE considerations can provide protection for hazardous materials for the following:</p> <ul style="list-style-type: none"> <li>• Staff contact or exposure is anticipated</li> <li>• Ambulatory patients may require assistance</li> <li>• Chemical is known AND is a low risk contaminant</li> </ul>	<p><b>PPE Level: C</b></p> <p>Splash protection:</p> <ul style="list-style-type: none"> <li>• Full-face shield</li> <li>• Chemical resistant suit with hood</li> <li>• Chemical resistant gloves</li> <li>• Chemical resistant boots</li> </ul> <p><b>Respiratory protection:</b> Air Purifying Respirator</p>	<p><b>See Training Addendum</b></p>
<p><b>Preferred Protection</b></p> <p>These PPE considerations can provide hazardous materials protection for the following:</p> <ul style="list-style-type: none"> <li>• Actual staff contact with patients or contaminant is anticipated.</li> <li>• The agent is unknown AND/OR is a high risk contaminant</li> </ul>	<p><b>PPE Level: B</b></p> <p>Splash protection:</p> <ul style="list-style-type: none"> <li>• Chemical resistant suit with hood</li> <li>• Chemical resistant boot &amp; gloves</li> <li>• Full face shielding</li> </ul> <p><b>Respiratory protection:</b> Supplied Air / SCBA</p>	<p><b>See Training Addendum</b></p>

THE CAPITOL REGION  
METROPOLITAN MEDICAL RESPONSE SYSTEM

**APPENDICES TO THE  
RAPID ACCESS MASS  
DECONTAMINATION  
PROTOCOL**

# APPENDIX A: Chemical Warfare Agents

## Chemical Warfare Agents

### Nerve Agents

Volatility / Persistence	Semi – persistent		Persistent
Rate of Action	Rapid		
Route of Entry	Respiratory and skin		
Odor	Fruity	Camphor	Sulfur
Signs/Symptoms	Headache, runny nose, salivation, pin-point pupils, difficulty in breathing Tightness in chest, seizures/convulsions		
Self-protection	Respiratory and skin		
First Aid	Remove from contaminated area, treat symptoms – Atropine / 2 Pam Chloride		
Human Decontamination	Remove agent from skin If time and resources permit flush with warm water soap, if not copious amounts of water		

### Blister Agents / Vesicants

Common Name (Military)	Mustard (H)	Lewisite (L)	Phosgene Oxime (CX)
Volatility / Persistence	Persistent		
Rate of Action	Delayed	Rapid	
Route of Entry	Skin, inhalation, eyes		
Odor	Garlic	Geraniums	Irritating
Signs / Symptoms	Red, burning skin, blisters, sore throat, dry cough. Pulmonary edema, memory loss, seizures, coma. Some symptoms may be delayed up to 24 hours.		
Self-Protection	Respiratory and skin		
First Aid	Copious amounts of water, removal of clothing, airway maintenance, treat symptoms		
Decontamination	Removal of agent from skin, flushing with warm water and soap, or copious amounts of water.		

### Blood Agents

Common Name (Military)	Hydrogen Cyanide (AC)	Cyanogen Chloride (CK)	Arsine (SA)
Volatility / Persistence	Non – persistent		
Rate of Action	Rapid		
Route of Entry	Inhalation, skin and eyes		
Odor	Burnt almonds or peach kernels		Garlic
Signs / Symptoms	Cherry red skin/lips, rapid breathing, dizziness, nausea/vomiting, seizures, pulmonary edema, respiratory arrest, dilated pupils, salivation		
Self – Protection	Respiratory and skin		
First Aid	Remove from contaminated area, administer cyanide kit, support ventilations, treat symptoms		
Decontamination	Remove clothing, remove contaminate from skin, flush with copious water, aerate.		

### Choking Agents

Common Name (Military)	Chlorine (CL)	Phosgene (CG)	Diphosgene (DP)
Volatility / Persistency	Non – persistent Vapors may be sustained in low areas		
Rate of Action	Rapid in higher concentrations Up to 3 hours in lower concentrations		
Rate of Entry	Respiratory and skin		
Odor	Bleach	Newly mown lawn	Cut grass or green corn
Signs / Symptoms	Eye and throat irritation, dizziness, chest tightness, headache, nausea, pulmonary edema, painful cough		
First Aid	Remove from contaminated area, remove clothing, assist ventilations		
Decontamination	Flush with copious amounts of water, aerate		

### Rules of Thumb

**Non-persistent agent dissipates in minutes to hours**  
**Semi-persistent agent dissipates in less than 12 hours**  
**Persistent agent dissipates over time greater than 12 hours**

## Appendix B: Biological Agents

### Biological Agents

<b>Agent</b>	<b>Dissemination</b>	<b>Transmission</b> (person-to- person)	<b>Incubation</b>	<b>Lethality</b>
Anthrax	Aerosolized spores	No Exception – Cutaneous	1 – 5 days	High
Botulinum Toxin	Ingestion & aerosol	No	Hours to days	High
Ricin	Ingestion & aerosol	No	Hours to days	High
Plague	Aerosol	High	1 – 3 days	High if untreated
Ebola	Aerosol & contact	Moderate	4 – 16 days	Moderate to high
T-2 Mycotoxins	Ingestion & aerosol	No	2 – 4 days	Moderate
Tularemia	Aerosol	No	1 -10 days	Moderate if untreated
Cholera	Ingestion & aerosol	Rare	12 hours – 6 days	Low if treated
Smallpox	Aerosol	High	10-12 days	Low if treated
VEE	Aerosol & infected organisms	Low	1 – 6 days	Low
Q Fever	Ingestion & aerosol	Rare	2 – 3 weeks	Very Low
Staphylococcal Enterotoxin	Ingestion & aerosol	No	Hours	Very Low

## Appendix C: Radiation

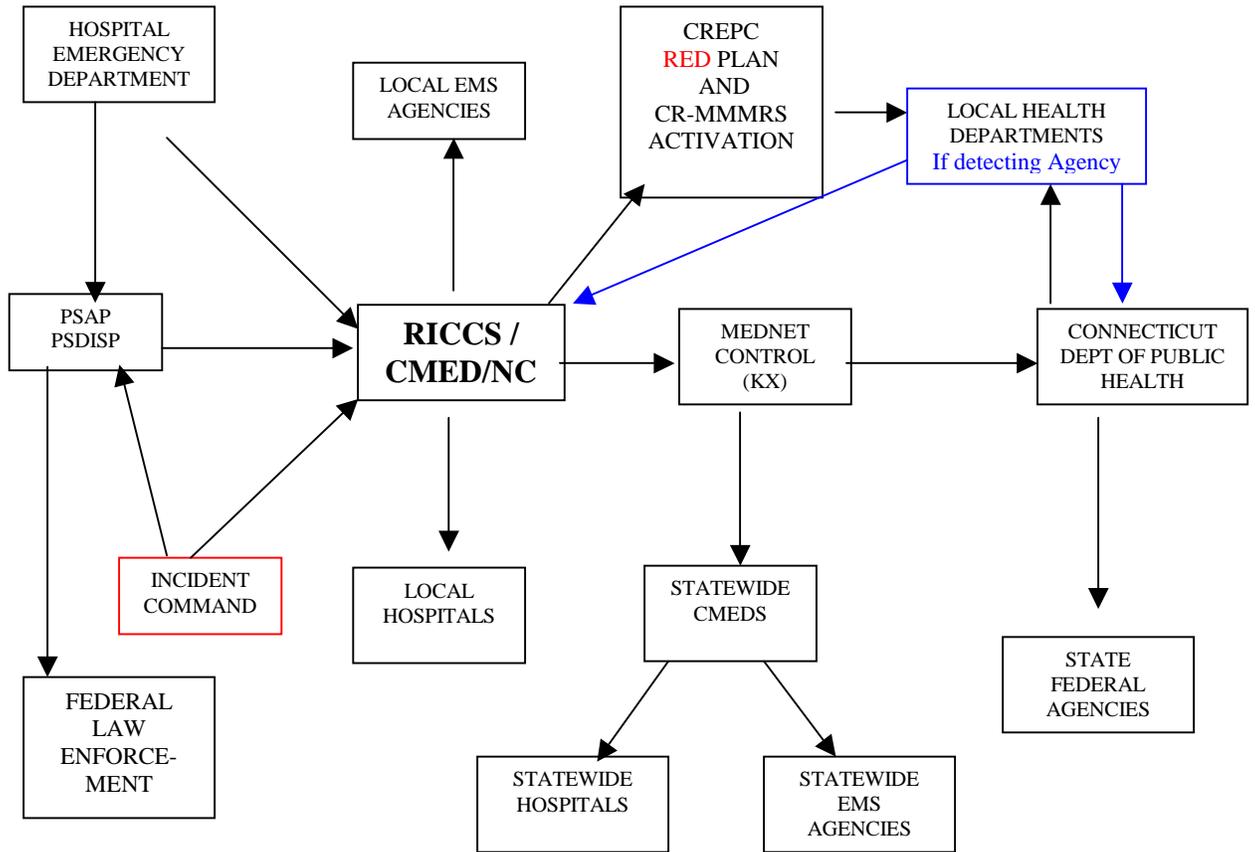
### Radiation Concerns

Exposure Pathway	Exposure Source
External exposure	Ionizing radiation from WMD detonation Exposure to detonation plume Exposure to plume fallout Surface contamination & activated by products Personal contamination to skin, hair, clothing, etc.
Internal exposure penetration / contamination	Inhalation of plume Inhalation or ingestion of personal contamination Inhalation of air suspended contamination Absorption of contamination through skin Ingestion of contaminated food

### Radiation Sickness

Mild	Moderate	Severe
Nausea, fatigue, headache, no appetite. Usually within a few hours after exposure	Nausea, no appetite, reddening of skin, fatigue, depression, weakness. Usually within 2-3 hours of exposure, symptoms may improve and then return, possible delays in healing of wounds	Nausea, fatigue, no appetite, depression, weakness, recurrence of symptoms. 1 – 2 weeks; fever, diarrhea, ulceration of mouth & gums, bleeding, hair loss, vascular collapse, hypotension, death

## Appendix D: Notification Pathways For a Regional Mass-Casualty Event



## **Appendix E: Directions for Decontamination / Scene of Event**

The following is a suggested format for a flyer intended for distribution to persons who may have been exposed to a hazardous agent:

**You may have been exposed to a hazardous substance. In order to help you and to protect your health and safety, and the safety of others, please follow our directions.**

**You must be thoroughly cleaned [decontaminated] before you can be treated. Please follow these directions as you enter the wash areas for cleaning.**

- 1. Follow the hose line on the ground**
- 2. When you first enter the wash area, remove your outer garments**
- 3. If you have been contaminated with a liquid, remove all garments**
- 4. Place the garments in the plastic bag**
- 5. As you pass through the wash area, gently rub any exposed areas of your body with your hands**

## Appendix F: Directed Self-Decontamination

### Directed Self Decontamination

#### TO THE PATIENT:

You may have been exposed to a hazardous substance. For your own health and safety as well as others, you must be thoroughly cleaned before we can safely treat you.

This is what you must do. Please read all the steps. Then proceed to follow them. We will be waiting for you at the end with towels to dry you off.

1. Go to the designated area
2. Prepare to undress behind the privacy curtain

3. Open the plastic bags.
4. Place all of your valuables (wallet, keys) into the small plastic bag and seal it. If you have prescription glasses or hearing aids, keep them with you.
5. Remove ALL your clothing.
6. Put clothes into the large plastic bag.
7. Put the small valuables bag and large clothes bag in the designated place.
8. Put on the wristband or neck identification.
9. Now step into the shower / tub area.

#### **Shower Area**

10. Wet yourself all over in the shower.
11. Thoroughly wash with soap and water, paying special attention to hair, ears, etc.
12. Rinse for at least one minute.
13. Step out of the shower area. We will have a towel and temporary clothing for you. We will keep you covered.
14. Then we will take you to the treatment area.
15. If it is safe, we will give you back your clothes and valuables.

## **“Trash Bag Decon”**

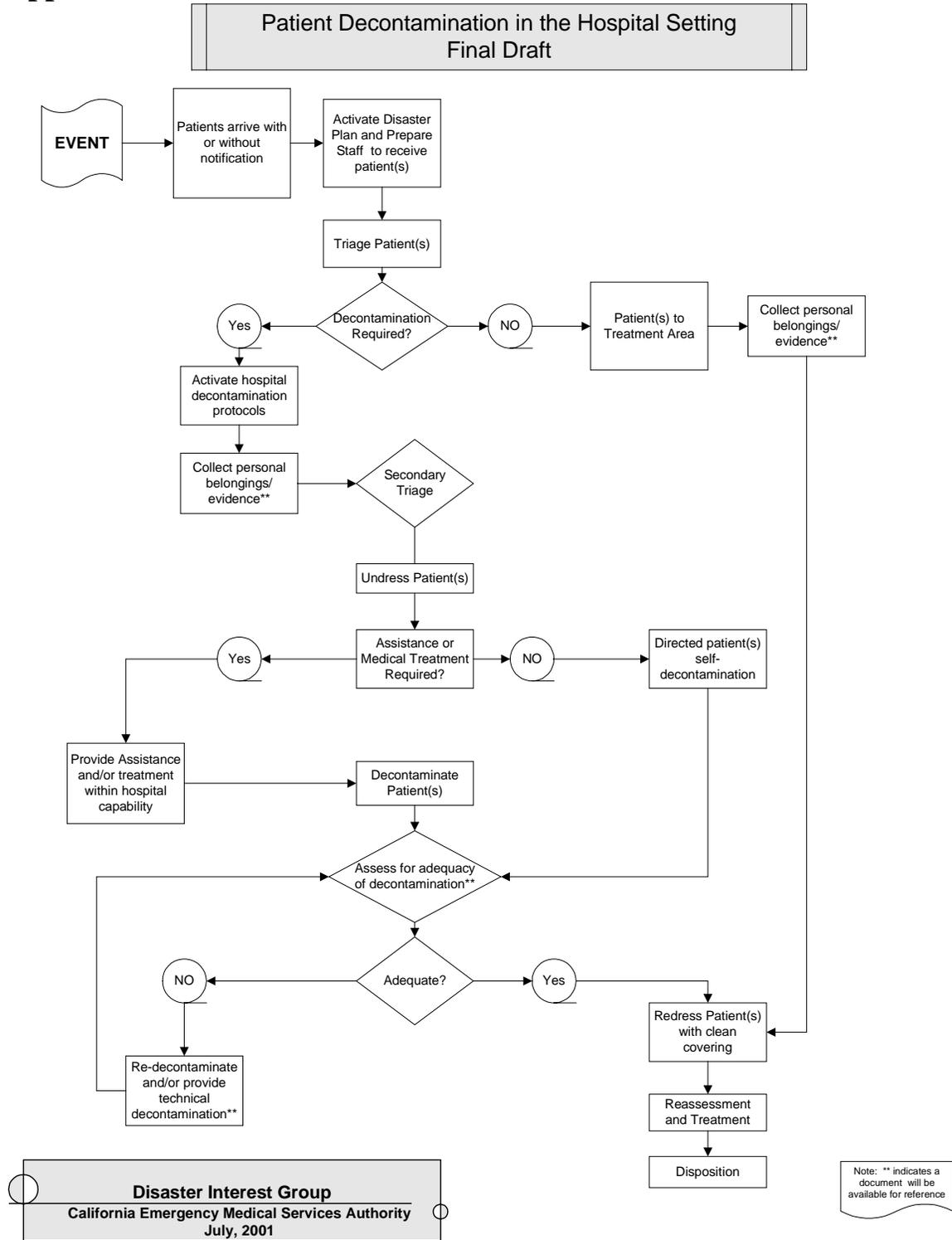
### **CONTENTS OF EACH TRASH BAG:**

- Armband for patient (pre-numbered) – taped to the outside of the bags or near the inside top.
- Medium Zip-lock bag (gallon sized, pre-numbered) for valuables (i.e. watch, keys, jewelry, wallet) - Have the patient keep glasses on; may need to keep hearing aid also.
- Large Zip-lock bag (at least 24” X 24”, pre-numbered) for clothing
- Large Zip-lock bag ( 24” X 30”, pre-numbered) to place all these items in – This will be used to double-bag the clothes and valuables.
- Black lawn-type trash bag (at least 59 gallon, larger better, 2.0 mil thickness) – Cut a hole in the top, big enough for a head and arm holes in the side. – This will be used for patients to use as a covering if no other shelter is available. They can disrobe under the bag and rinse under it.

#### Notes:

- Each kit should be pre-numbered with the same number, for tracking purposes.
- Optional: Can include a Tyvek-type covering for a patient gown.

# Appendix G: HOSPITAL DECONTAMINATION PROCEDURES



## Appendix H: Hospital-Based Decontamination Process Outline

- I. Identification of Event
  - a. Recognition of Contaminated Patient
  - b. Identify Contaminated areas
  - c. Establish Control Zones
  
- II. Activation of Response Plan
  - a. Facility Notification
  - b. Job Assignments
  - c. External notifications
  
- III. Determine need for Decontamination
  - a. Who
  - b. Priority
  
- IV. Action Plan development
  - a. Within Facilities Capabilities?
  - b. Decon site
  - c. Flow
  - d. Procedure
  - e. Selection of PPE
  - f. Pre-entry monitoring of Decon Resource Team
  - g. Equipment set up
  - h. Safety considerations
  
- V. General Decontamination process
  - a. Patient remove valuables
  - b. Remove clothing
  - c. Rinse
    1. Start at head and move down
  - d. Soap wash
    1. Gentle washing
    2. Best to use sponges or soft brushes
    3. Start at head and move down, remember nooks and crannies
    4. Move to next step if possible (next kiddie pool)
    5. Wash bottom of foot, step into next area without putting foot in “dirty water”.  
Repeat with other foot.
  - e. Rinse
    1. Lots of water
    2. Start at head and move down
    3. Rinse bottom of foot, step into next area without putting foot in “dirty water”.  
Repeat with other foot.
  - f. Dry Clean Covering
  
- VI. Decontamination Re-evaluation
  - a. Need for further triage?
  
- VII. Medical Triage

VIII. Termination Process

- a. Decon the Decon Resource Team
  - 1. Start with most potentially contaminated.
  - 2. Same decon process as patients, except doing with suit on.
- b. Post monitoring of Decon Resource Team
- c. Containment of PPE
- d. Containment of expendable equipment
- e. Containment of collected runoff
- f. Containment of durable equipment that will need decontaminated
- g. Maintain security on all items until properly disposed of.
- h. Debrief/evaluation of process
- i. Complete documentation

## Appendix I: Rapid Triage for Chemically Exposed Patients (No Apparent Traumatic Injuries)

Agent Class	<b>RED</b>  Immediate	<b>YELLOW</b>  Delayed	<b>GREEN</b>  Minor	<b>BLACK</b>  Deceased / Expectant
<b>Nerve Agent</b>	<ul style="list-style-type: none"> <li>• Seizure/LOC</li> <li>• Altered Sensorium</li> <li>• Respiratory Difficulties</li> <li>• Bradycardia</li> </ul>	<ul style="list-style-type: none"> <li>• Alert</li> <li>• Increased secretions</li> <li>• Vomiting</li> <li>• Diarrhea</li> </ul>	Asymptomatic	Pulseless Asystole Apnea
<b>Cellular Asphyxiant</b>	<ul style="list-style-type: none"> <li>• Altered Sensorium</li> <li>• Hypotension</li> <li>• Bradycardia</li> <li>• Respiratory Distress</li> </ul>	<ul style="list-style-type: none"> <li>• Alert</li> <li>• Headache</li> <li>• Tachycardia</li> <li>• Strong Pulses</li> <li>• No respiratory compromise</li> </ul>	Asymptomatic	Apnea Asystole Pulseless
<b>Pulmonary Irritant</b>	<ul style="list-style-type: none"> <li>• Altered Sensorium</li> <li>• Hypotension</li> <li>• Respiratory Distress</li> <li>• Stridor / Wheezing</li> </ul>	<ul style="list-style-type: none"> <li>• Alert</li> <li>• No respiratory compromise</li> <li>• Irritation of Mucous Membranes</li> </ul>	Asymptomatic	Apnea Asystole Pulseless
<b>Vesicant</b>	<ul style="list-style-type: none"> <li>• Altered Sensorium</li> <li>• Hypotension</li> <li>• Respiratory Distress</li> <li>• Visual Deficits</li> </ul>	<ul style="list-style-type: none"> <li>• Alert</li> <li>• No Cardiac Symptoms</li> <li>• No respiratory compromise</li> <li>• &lt; 5% TBSA</li> </ul>	Asymptomatic	Apnea Asystole Pulseless > 50% TBSA

## APPENDIX J: HEALTHCARE HAZMAT TRAINING GRID

Course	Target Audience	Rationale	Curriculum
<b>HAZMAT Awareness</b>	All Hospital Staff	Hospital staff to educate staff to the hospital approach to emergency management	<p><b>A)</b> Basic overview of the Hospital Emergency Operations System</p> <p><b>B)</b> Basic appreciation for the diversity of plans (Abduction, Fire, Bomb, Biological, and Chemical etc.)</p> <p><b>C)</b> Understanding that all employees play a role in reporting such an event within the hospital structure and that they should review their departmental SOP's.</p> <p><b>THIS EDUCATION COULD BE INCLUDED IN NEW EMPLOYEE ORIENTATION AS PART OF THE EOC OVERVIEW</b></p>
<b>HAZMAT Awareness Level</b> (Complies with training requirements in OSHA's 29 CFR1910.120 (HAZOPER Standard))	Security & Safety Staff, Emergency Department Staff, Laboratory Staff, Environmental Services Staff, Facilities Staff	Individuals who are likely to witness or discover a hazardous substance release and who have been trained to initiate an emergency response sequence by notifying the proper hospital authorities in keeping with hospital emergency operations plans. The staff takes no other actions beyond notification.	<p><b>A)</b> An understanding of what hazardous substances are, and the risks associated with them in an incident.</p> <p><b>B)</b> An understanding of the potential outcomes associated with an emergency created when hazardous substances are present.</p> <p><b>C)</b> The ability to recognize the presence of hazardous substances in an emergency at the Hospital.</p> <p><b>D)</b> An understanding of the role of the first responder awareness individual in the Hospital's Emergency Operations Plan.</p> <p><b>E)</b> The ability to realize the need for additional resources, and to make appropriate notification to the communication center.</p>
<b>HAZMAT Operations Level</b>	Emergency Department Staff, Security, Safety, Infectious Disease Departmental Staff, Environmental Services or any other staff expected to respond to an event within the boundaries of the hospital and participate in limited response actions.	Individuals who would be assigned to areas where there is substantial risk of exposure to hazardous material, such as the decontamination or initial triage areas, or those required to dress in PPE to treat contaminated patients. Those staff that would be expected to respond to a release or an incident where hazardous materials may be present for the purpose of protecting nearby persons, property, or the environment from the effects of the release. They are trained to respond in a defensive fashion without actually trying to stop any release. Their function maybe to conduct patient decontamination activities, keep a hazardous material from spreading and prevent exposures.	<p><b>A)</b> A discussion of Hospital Emergency Operations Plans</p> <p><b>B)</b> Review of the Types of occurrences that can be anticipated: Chemical event, Biological, Nuclear, WMD, Bomb, Fire</p> <p><b>C)</b> Knowledge of the basic hazard and risk assessment techniques.</p> <p><b>D) Know</b> how to select and use proper Personal Protective Equipment</p> <p><b>E)</b> Know what type of PPE is offered by the Hospital and where is it kept.</p> <p><b>SEE PPE MODULE BELOW</b></p> <p><b>F)</b> Know how to perform basic control, containment and or confinement operations within the resources provided at the Hospital</p> <p><b>G)</b> Know how to implement basic decontamination procedures. <b>SEE PATIENT DECON MODULE BELOW</b></p>

Course	Target Audience	Rationale	Curriculum
<b>Specific Module: Training on How to Use PPE</b>	All Staff expected to wear PPE	Individuals who would be assigned to areas where there is substantial risk of exposure to hazardous material, such as the decontamination or initial triage areas, or those required to dress in PPE to treat contaminated patients.	<b>A)</b> Discussion of the levels of PPE as described in 29 CFR 1910.120 <b>B)</b> A Discussion of the level and types of PPE available in the Hospital. <b>C)</b> Selection and Use of PPE criteria <b>D)</b> Discussion of Medical evaluations prior to use and medical monitoring during use <b>E)</b> Hands on demonstration where students are fit for the PPE they will be expected to use. <b>F)</b> Donning and Doffing procedures
<b>Specific Module: Patient Decontamination</b>	Staff expected to decontaminate patients and/or responders.	Staff expected to decontaminate patients and/or responders.	<b>A)</b> Review of Hospital Decontamination Plan <b>B)</b> Discussion of the types of Decontamination "Assistive" vs. "Non-Assistive", "Wet" vs. "Dry" <b>C)</b> Selection method, How to determine what type of decontamination is required <b>D)</b> How "Clean" is clean, detection methods <b>E)</b> Discussion of Maintaining Chain of Custody for Patients Personal Belongings/Possible evidence <b>F)</b> Discussion of managing Female vs. Male separation/privacy barriers <b>G)</b> Students should demonstrate the skills required to conduct both assistive and non-assistive decontamination of patients.
<b>Specific Module: Incident Command System: Terminology and Structure</b>	Administration, Security & Safety, Various Leadership	Individuals responsible for designing and/or implementing emergency preparedness plan. Staff that will be expected to execute a role during an activation	<b>A)</b> Discussion of the Hospital Emergency Incident Command System (HEICS) <b>B)</b> Review of the HEICS organizational chart <b>C)</b> Review of the role descriptions and job action sheets as described in the HEICS organizational Chart <b>D)</b> Explanation of decision making ability and role interaction based on the HEICS organizational Chart. <b>E)</b> Role play/ tabletop exercise where students learn by participating in the exercise.
<b>Specific Module: Syndromic Surveillance</b>	Emergency Department Staff, Infectious Disease Staff	Staff expected to identify and report symptoms.	<b>A)</b> Explanation of Syndromic Surveillance Requirements <b>B)</b> Explanation of the expectations of the State Department of Health <b>C)</b> Review of symptomatology/pathology required to be reported <b>D)</b> Review of Hospital Policy for reporting

## References

- National Institute of Standards & Technology, Special Publication 981
- State of Connecticut Consequence Management Guide for Deliberately-Caused Incidents Involving Chemical Agents, OEM / Military Dept.
- California Bioterrorism Response Planning Guide
- Anchorage Fire Department Cold Weather Decontamination Guide
- OSHA 29 CFR 1910.120

# HAZMAT FOR HEALTHCARE

## GLOSSARY OF TERMS

The express purpose of this glossary of standardized terms is to provide common and readily understandable definitions for both hazardous materials emergency response and terrorism in order to facilitate communications and operations among emergency responders when dealing with hazardous materials incidents. **This document is not intended to be a legal or scientific reference.**

<b>Abatement</b>	The actions taken to reduce the amount, degree of the hazard, or intensity of the release or threatened release of a hazardous material.
<b>Absorption</b>	The process of absorbing or “picking up” a liquid hazardous material to prevent enlargement of the contaminated area; 2) Movement of a toxicant into the circulatory system by oral, dermal, or inhalation exposure.
<b>Acceptable Risk</b>	A risk judged to be outweighed by corresponding benefits or one that is of such a degree that it is considered to pose minimal potential for adverse effects.
<b>Access Control Point</b>	The point of entry and exit that regulates traffic to and from control zones.
<b>Adjuvant</b>	A substance used in pesticide formulation to aid its action. (Also used in the manufacture of drugs.)
<b>Adsorption</b>	Process of adhering to a surface.
<b>Aerosols</b>	Liquid droplets, or solid particles dispersed in air, that are of fine enough particle size (0.01 to 100 microns) to remain dispersed for a period of time.
<b>Airborne Pollutants</b>	Contaminants that are carried/released into the atmosphere or air.
<b>Air Purifying Respirators (APR)</b>	Personal Protective Equipment; a breathing mask with specific chemical cartridges designed to either filter particulates or absorb contaminants before they enter the worker’s breathing zone. It is intended to be used only in atmospheres where the chemical hazards and concentrations are known.
<b>Air Purifying Respirator - powered</b>	An APR with a portable motor to force air through the filtering/purifying cartridges for use only in atmospheres where the chemical hazards and concentrations are known.
<b>Air Quality Management District</b>	A local/regional air pollution agency responsible for regulation and monitoring of air quality.
<b>Area Plan</b>	A document established to facilitate emergency response to a release or threatened release of a hazardous material within a city or county. (California Health and Safety Code, Section 25503, Chapter 6.95)
<b>Asphyxiant</b>	A vapor or gas that can cause unconsciousness or death by suffocation (lack of oxygen).
<b>Base (Chemical)</b>	A hydroxide containing (-OH) corrosive material that when in a water solution is bitter, more or less irritating, or caustic to the skin.
<b>Base (ICS)</b>	Location at which additional equipment, apparatus, and personnel are

	assembled for primary support of activities at the incident scene. The command post may be located at the "base". (NIIMS)
<b>Biohazard</b>	Infectious agents presenting a risk or potential risk to living organisms, either directly through infection or indirectly through disruption of the environment.
<b>Biological Agents</b>	Biological materials that are capable of causing acute or long term damage to living organisms. (NFPA 1990, 1-3)
<b>Boiling Liquid Expanding Vapor Explosion (BLEVE)</b>	A container failure with a release of energy, often rapidly and violently, which is accompanied by a release of gas to the atmosphere and propulsion of the container or container pieces due to an overpressure rupture.
<b>Boom</b>	A floating physical barrier serving as a continuous obstruction to the spread of a contaminant.
<b>Bootie</b>	A sock like over-boot protector worn to minimize contamination.
<b>Breakthrough Time</b>	The elapsed time between initial contact of the hazardous chemical with the outside surface of a barrier, such as protective clothing material, and the time at which the chemical can be detected at the inside surface of the material.
<b>Buddy System</b>	A system of organizing employees into work groups in such a manner that each employee of the work group is designated to be observed by at least one other employee in the work group. [8 CCR 5192 (a)(3)]
<b>Buffer Zone</b>	The area of land that surrounds a hazardous waste facility on which certain usages and activities are restricted to protect the public health and safety, and the environment from existing or potential hazards caused by the migration of hazardous waste.
<b>Carboy</b>	A container, usually encased in a protective basket or crate, used to ship hazardous materials, particularly corrosives.
<b>Carcinogen</b>	An agent that produces or is suspected of producing cancer. (FEMA HMCP)
<b>Cease and Desist Order</b>	Legal direction to stop any and all activities.
<b>Celsius (Centigrade) C</b>	The internationally used scale for measuring temperature, in which 100 <sup>0</sup> is the boiling point of water at sea level (1 atmosphere), and 0 <sup>0</sup> is the freezing point.
<b>Center for Disease Control (CDC)</b>	The federally funded research organization tasked with disease control and research.
<b>Chemical Protective Clothing Material</b>	Any material or combination of materials used in an item of clothing for the purpose of isolating parts of the wearer's body from contact with a hazardous chemical. (NFPA 1991,1-3)
<b>Chemical Protective Suit</b>	Single or multi-piece garment constructed of chemical protective clothing materials designed and configured to protect the wearer's torso, head, arms, legs, hands, and feet. (NFPA 1991, 1-3)
<b>Chemical Resistance</b>	The ability to resist chemical attack. The attack is dependent on the

	method of test and its severity is measured by determining the changes in physical properties. Time, temperature, stress, and reagent may all be factors that affect the chemical resistance of a material.
<b>Chemical Resistant Materials</b>	Materials that are specifically designed to inhibit or resist the passage of chemicals into and through the material by the processes of penetration, permeation or degradation.
<b>Chemical Transportation Emergency Center (CHEMTREC)</b>	The Chemical Transportation Center, operated by the Chemical Manufacturers Association (CMA), can provide information and technical assistance to emergency responders. (Phone number- 1-800-424-9300)
<b>Chronic Effect</b>	Delayed or slowly developing harm resulting from a chemical exposure which is often hard to recognize.
<b>Cleanup</b>	Incident scene activities directed toward removing hazardous materials, contamination, debris, damaged containers, tools, dirt, water, and road surfaces in accordance with proper and legal standards, and returning the site to as near a normal state as existed prior to the incident. (Sacramento Fire Department HMRT)
<b>Cleanup Company (Hazardous Waste)</b>	A commercial business entity available for hire to specifically remove, transport, and/or dispose of hazardous wastes; and when appropriate, must meet California Highway Patrol and Department of Toxic Substances Control requirements.
<b>Cleanup Operation</b>	An operation where hazardous substances are removed, contained, incinerated, neutralized, stabilized, cleared up, or in any other manner processed or handled with the ultimate goal of making the site safer for people or the environment. (8 CCR 5192(a)(3))
<b>Clean Water Act (CWA)</b>	Federal legislation to protect the nation's water and set State water quality standards for interstate navigable waters as the basis for pollution control and enforcement. The main objective is to restore and maintain the chemical, physical and biological integrity of the Nation's waters.
<b>Cold Zone</b>	The area outside of the warm zone. Equipment and personnel are not expected to become contaminated in this area. This is the area where resources are assembled to support the hazardous materials operation.
<b>Combustible Liquid</b>	Liquids with a flashpoint above 100 <sup>o</sup> F. (49 CFR 173.120 (b)(2).)
<b>Command</b>	The act of directing, ordering, and/or controlling resources by virtue of explicit legal, agency, or delegated authority. (NIIMS)
<b>Command Post</b>	The location from which the primary command functions are executed, usually co-located with the incident base.
<b>Community Right-to-Know</b>	Legislation requiring business establishments to provide chemical inventory information to local agencies or the public.
<b>Compatibility</b>	The matching of protective chemical clothing to the hazardous material involved to provide the best protection for the worker.
<b>Compatibility Charts</b>	Permeation and penetration data supplied by manufacturers of chemical protective clothing to indicate chemical resistance and breakthrough time of various garment materials as tested against a battery of chemicals. This test data should be in accordance with ASTM and NFPA standards.

<b>Compressed Gas</b>	Any material or mixture having an absolute pressure exceeding 40 p.s.i. in the container at 70 <sup>o</sup> F or, regardless of the pressure at 70 <sup>o</sup> F, having an absolute pressure exceeding 104 p.s.i. at 130 <sup>o</sup> F; or any liquid flammable material having a vapor pressure exceeding 40 p.s.i. absolute at 100 <sup>o</sup> F as determined by testing. Also includes cryogenic or “refrigerated liquids” (DOT) with boiling points lower than -130 <sup>o</sup> F at 1 atmosphere.
<b>Confinement</b>	Procedures taken to keep a material in a defined or localized area.
<b>Contact</b>	Being exposed to an undesirable or unknown substance that may pose a threat to health and safety. (Sacramento Fire Department HMRT)
<b>Container</b>	Any device, in which a hazardous material is stored, transported, disposed of, or otherwise handled.
<b>Containment</b>	All activities necessary to bring the incident to a point of stabilization and to establish a degree of safety for emergency personnel greater than existed upon arrival.
<b>Contamination</b>	An uncontained substance or process that poses a threat to life, health, or the environment. (NFPA 472, sections 1-3)
<b>Contamination Control Line</b>	The established line around the contamination reduction zone that separates it from the support zone.
<b>Contamination Reduction Zone</b>	Term used by the Coast Guard to identify the area of moderate hazard where threat of contamination spread to the immediate surrounding area is low. It is the area immediately outside of the inner hot zone. (See Warm Zone.)
<b>Contingency Plan</b>	A pre-planned document presenting an organized and coordinated plan of action to limit potential pollution in case of fire, explosion, or discharge of hazardous materials; defines specific responsibilities and tasks.
<b>Control</b>	The procedures, techniques, and methods used in the mitigation of a hazardous materials incident, including containment, extinction, and confinement.
<b>Control Zones</b>	The designation of areas at a hazardous materials incident based upon safety and the degree of hazard. (NFPA 472, sections 1-3) (See Support Zone, Warm Zone, Hot Zone, and Decontamination Corridor.)
<b>Corrosive</b>	The ability to cause destruction of living tissue or many solid materials surfaces by chemical action.
<b>Cryogenic</b>	Gases, usually liquefied, that induce freezing temperatures of -150 <sup>o</sup> F and below (liquid oxygen, liquid helium, liquid natural gas, liquid hydrogen, etc.).
<b>CT Department of Environmental Protection (DEP) CT Office of Emergency Management (OEM)</b>	State agency responsible for enforcement of State environmental and conservation laws / regulations. Included is oversight of any incident that can lead to a hazardous materials release to the environment. Division within the State’s Military Department responsible for planning and management / coordination of emergency responses to natural & man made disasters, assisting other agencies, and communities with their planning, includes Radiological Emergency Planning, Division of Emergency Preparedness & Counter Terrorism , & operating the State’s EOC.

<b>CT Department of Transportation (DOT)</b>	State agency responsible for planning, designing, constructing, operating and maintaining the State's highway system. Works in cooperation with other public and private agencies in the identification, transportation, and containment of hazardous materials and the restoration of orderly traffic flow.
<b>CT Department of Public Health (DPH)</b>	State agency responsible for medical and health services. Including the State's medical testing Lab, Epidemiology, and Office of Emergency Medical Services.
<b>Damming</b>	A procedure consisting of constructing a dike or embankment to totally immobilize a flowing waterway contaminated with a liquid or solid hazardous substance. (EPA, 600/2-77-277)
<b>Dangerous When Wet</b>	A label required for water reactive materials (solid) being shipped under U.S. DOT, ICAO, and IMO regulations. A labeled material that is in contact with water or moisture may produce flammable gases. In some cases, these gases are capable of spontaneous combustion. (49 CFR 171.8)
<b>Decontamination (Decon)</b>	The physical and/or chemical process of reducing and preventing the spread of contamination from persons and equipment used at a hazardous materials incident. (Also referred to as "contamination reduction".) (NFPA 472, 1-3)
<b>Decontamination Corridor</b>	A distinct area within the warm zone that functions as a protective buffer and bridge between the hot zone and the cold zone, where decontamination stations and personnel are located to conduct decontamination procedures.
<b>Decontamination Officer</b>	A position within the FIRESCOPE ICS HM-120 that has responsibility for identifying the decontamination corridor location & types of decontamination, assigning stations, and managing all decontamination procedures.
<b>Decontamination Team</b>	A group of personnel and resources operating within a decontamination corridor.
<b>Degradation</b>	The loss in physical properties of an item of protective clothing due to exposure to chemicals, use, or ambient conditions.
<b>Delayed Toxic Exposure Effect</b>	The condition in which symptoms of an exposure are not present immediately after the exposure, but are delayed for a relatively short period of time (such as pulmonary edema a few hours after an inhalation exposure).
<b>Department of Defense (DOD)</b>	The Federal entity that provides the military forces needed to deter war and protect the security of our country.

<b>Department of Justice (DOJ)</b>	The Federal department which serves as counsel for the citizens of the Nation; represents them in enforcing the law in the public interest; through its thousands of lawyers, investigators, and agents it plays a key role in protection against criminals and subversion, in insuring healthy competition of business in our free enterprise system, in safeguarding the consumer, and in enforcing drug, immigration, and naturalization laws; plays a significant role in protecting citizens through its efforts for effective law enforcement, crime prevention, crime detection, and prosecution and rehabilitation of offenders; conducts all suits in the Supreme Court in which the United States is concerned; and represents the Federal Government in legal matters.
<b>Department of Transportation (DOT)</b>	This agency assures the coordinated, effective administration of the transportation programs of the Federal government and develops national transportation policies and programs conducive to the provision of fast, safe, efficient and convenient transportation at the lowest possible cost.
<b>DHS</b>	See California Department of Health Services.
<b>Dike</b>	An embankment or ridge, natural or man made, used to control the movement of liquids, sludges, solids, or other materials.
<b>Dispersion</b>	To spread, scatter, or diffuse through air, soil, surface or ground water.
<b>Diversion</b>	The intentional, controlled movement of a hazardous material to relocate it into an area where it will pose less harm to the community and the environment.
<b>Division</b>	That organizational level within the ICS having responsibility for operations within a defined geographic area. The "Division" Officer directs approximately 5 Companies, and answers to the "Operations" Officer.
<b>Dose</b>	The amount of substance ingested, absorbed, and/or inhaled per exposure period.
<b>Double gloving</b>	A set of gloves worn over those already in place for enhanced protection.
<b>Downwind</b>	In the direction in which the wind blows.
<b>Ecosystem</b>	A habitat formed by the interaction of a community of organisms with their environment.
<b>Edema</b>	The swelling of body tissues resulting from fluid retention.
<b>Emergency Medical Services (EMS)</b>	Functions as required to provide emergency medical care for ill or injured persons by trained providers.
<b>Emergency Medical Services Authority (EMSA)</b>	The State agency responsible for developing general guidelines for triage and handling of contaminated/exposed patients; develops and promotes hazardous materials training for emergency medical responders in the field and hospital emergency rooms; identifies and coordinates the procurement of medical assistance, supplies, and hospital beds when local and/or regional resources are depleted; and coordinates the evaluation of casualties to other areas of the State.

<b>Emergency Operations Center (EOC)</b>	The secured site where government officials exercise centralized coordination in an emergency. The EOC serves as a resource center and coordination point for additional field assistance. It also provides executive directives to and liaison for State and federal government representatives, and considers and mandates protective actions.
<b>Emergency Operations Plan</b>	A document that identifies the available personnel, equipment, facilities, supplies, and other resources in the jurisdiction, and states the method or scheme for coordinated actions to be taken by individuals and government services in the event of natural, man-made, and attack related disasters.
<b>Emergency Response Personnel</b>	Personnel assigned to organizations that have the responsibility for responding to different types of emergency situations. (NFPA 1991, 1-3)
<b>Endothermic</b>	A process or chemical reaction which is accompanied by absorption of heat.
<b>Entry Point</b>	A specified and controlled location where access into the hot zone occurs at a hazardous materials incident.
<b>Entry Team Leader</b>	The entry leader is responsible for the overall entry operations of assigned personnel within the hot zone. (FIRESCOPE ICS-HM)
<b>Environmental Protection Agency (EPA)</b>	The purpose of the Environmental Protection Agency (EPA) is to protect and enhance our environment today and for future generations to the fullest extent possible under the laws enacted by Congress. The Agency's mission is to control and abate pollution in the areas of water, air, solid waste, pesticides, noise, and radiation. EPA's mandate is to mount an integrated, coordinated attack on environmental pollution in cooperation with State and local governments.
<b>Etiological Agent</b>	A viable microorganism or its toxin, which causes or may cause human disease.
<b>Evacuation</b>	The removal of potentially endangered, but not yet exposed, persons from an area threatened by a hazardous materials incident. (FIRESCOPE ICS-HM)
<b>Explosive</b>	Any chemical compound, mixture, or device, of which the primary or common purpose is to function by explosion, i.e., with substantial instantaneous
<b>Exposure</b>	The subjection of a person to a toxic substance or harmful physical agent through any route of entry.
<b>Fahrenheit</b>	The scale of temperature in which 212 <sup>o</sup> is the boiling point of water at 760 mm Hg and 32 <sup>o</sup> is the freezing point.
<b>First Responder</b>	The first trained person(s) to arrive at the scene of a hazardous materials incident. May be from the public or private sector of emergency services.

<b>First Responder, Awareness Level</b>	Individuals who are likely to witness or discover a hazardous substance release who have been trained to initiate an emergency response sequence by notifying the proper authorities of the release. They would take no further action beyond notifying the authorities of the release. (8 CCR 5192(q)(6))
<b>First Responder, Operations Level</b>	Individuals who respond to releases or potential releases of hazardous substances as part of the initial response to the site for the purpose of protecting nearby persons, property, or the environment from the effects of the release. They are trained to respond in a defensive fashion without actually trying to stop the release. Their function is to contain the release from a safe distance, keep it from spreading, and prevent exposures. (8 CCR 5192(q)(6))
<b>Flammable Liquid</b>	Any liquid having a flash point below 100 <sup>o</sup> F (37.8 <sup>o</sup> C). (49 CFR 173.115(a))
<b>Flashpoint</b>	The minimum temperature of a liquid at which it gives off vapors sufficiently fast to form an ignitable mixture with air and will flash when subjected to an external ignition source, but will not continue to burn.
<b>Food and Drug Administration (FDA)</b>	Performs, directs, and coordinates detection and control activities which protect consumers against adulterated, misbranded, or falsely advertised foods, drugs, medical devices, and hazardous products.
<b>Fully Encapsulating Suits</b>	Chemical protective suits that are designed to offer full body protection, including Self Contained Breathing Apparatus (SCBA), are gas tight, and meet the design criteria as outlined in NFPA Standard 1991.
<b>Fume</b>	Airborne dispersion consisting of minute solid particles arising from the heating of a solid material such as lead, in distinction to a gas or vapor. This physical change is often accompanied by a chemical reaction, such as oxidation. Fumes flocculate and sometimes coalesce. Odorous gases and vapors should not be called fumes.
<b>Gas</b>	A state of matter in which the material has very low density and viscosity; can expand and contract greatly in response to changes in temperature and pressure; easily diffuses into other gases; readily and uniformly distributes itself throughout any container. A gas can be changed to a liquid or solid state by the combined effect of increased pressure and/or decreased temperature.
<b>Group</b>	Groups are established to divide the incident into functional areas of operation.
<b>Habitat</b>	The native environment of an animal or plant; the natural place for life and growth of an animal or plant.
<b>Hazard</b>	Any situation that has the potential for causing damage to life, property, and/or the environment.
<b>Hazardous Chemical</b>	A term used by the United States Occupational Safety and Health Administration (OSHA) to denote any chemical that would be a risk to employees if exposed in the workplace. The list of hazardous chemicals is found in 29 CFR.
<b>Hazardous Material (Hazardous materials)</b>	A substance or combination of substances which, because of quantity, concentration, physical, chemical or infectious characteristics may cause, or significantly contribute to an increase in deaths or serious illness; and/or

	pose a substantial present or potential hazard to humans or the environment.
<b>Hazardous Substance</b>	Hazardous Substance, as used by the California Department of Toxic Substances Control, encompasses every chemical regulated by both the Department of Transportation (hazardous materials) and the Environmental Protection Agency (hazardous waste), including emergency response (8 CCR 5192).
<b>Hazardous Waste Facility</b>	Any location used for the treatment, transfer, disposal or storage of hazardous waste as permitted and regulated by the California Department of Toxic Substances Control.
<b>Herbicide</b>	An agricultural chemical intended for killing plants or interrupting their normal growth. (See Pesticides.)
<b>High Performance Liquid Chromatography (HPLC)</b>	A procedure used in organics analysis to separate chemical mixtures based on differential ionic absorption to various substrates.
<b>Hot Zone</b>	An area immediately surrounding a hazardous materials incident, which extends far enough to prevent adverse effects from hazardous materials releases to personnel outside the zone. This zone is also referred to as the "exclusion zone", the "red zone", and the "restricted zone" in other documents. (NFPA 472, 1-3)
<b>Immediately Dangerous to Life or Health (IDLH)</b>	An atmospheric concentration of any toxic, corrosive or asphyxiant substance that poses an immediate threat to life or would cause irreversible or delayed adverse health effects or would interfere with an individual's ability to escape from a dangerous atmosphere. (8 CCR 5192(a)3)
<b>Information Officer (IO)</b>	The individual assigned to act as the liaison between the Incident Commander and the news media, as well as other groups.
<b>Incident</b>	An event involving a hazardous material or a release or potential release of a hazardous material.
<b>Incident Action Plan (IAP)</b>	A plan developed at the field response level which contains objectives reflecting the overall incident strategy and specific tactical actions and supporting information for the next operational period. The plan may be oral or written.
<b>Incident Command</b>	A disciplined method of management established for the specific purpose of control and direction of resources and personnel.
<b>Incident Commander (IC)</b>	The individual responsible for overall management of the incident at the field level.
<b>Incident Command System (ICS)</b>	The combination of facilities, equipment, personnel, procedures, and communications operating within a common organizational structure, with responsibility for the management of resources to effectively accomplish stated objectives pertinent to an incident.
<b>Ingestion</b>	The process of taking substances such as food, drink, and medicine into the body through the mouth.
<b>Irritant</b>	A material that has an anesthetic, irritating, noxious, toxic, or other similar property that can cause extreme annoyance or discomfort. (49 CFR)
<b>Isolating the Scene</b>	Preventing persons and equipment from becoming exposed to a release or threatened release of a hazardous material by the establishment of site

	control zones.
<b>LC<sub>50</sub> (lethal concentration, 50%)</b>	The amount of a toxicant in air which is deadly to 50% of the exposed lab animal population within a specified time.
<b>LD<sub>50</sub> (lethal dose, 50%)</b>	The amount of a toxicant administered by other than inhalation which is deadly to 50% of the exposed lab animal population within a specified time.
<b>Leak</b>	The uncontrolled release of a hazardous material which could pose a threat to health, safety, and/or the environment.
<b>Level of Protection</b>	In addition to appropriate respiratory protection, designations of types of personal protective equipment to be worn based on NFPA standards. <ul style="list-style-type: none"> <li>• <b>Level A</b> - Vapor protective suit for hazardous chemical emergencies.</li> <li>• <b>Level B</b> - Liquid splash protective suit for hazardous chemical emergencies.</li> <li>• <b>Level C</b> - Limited use protective suit for hazardous chemical emergencies.</li> </ul>
<b>Level One Incident</b>	Hazardous materials incidents which can be correctly contained, extinguished, and/or abated utilizing equipment, supplies, and resources immediately available to first responders having jurisdiction, and whose qualifications are limited to and do not exceed the scope of training as explained in 8 CCR 5192, or California Government Code (CGC), Chapter 1503, with reference to "First Responder, Operational Level".
<b>Level Two Incident</b>	Hazardous materials incidents which can only be identified, tested, sampled, contained, extinguished, and/or abated utilizing the resources of a Hazardous Materials Response Team, which requires the use of specialized chemical protective clothing, and whose qualifications are explained in 8 CCR 5192, or California Government Code (CGC), Chapter 1503, with reference to "Hazardous Materials Technician Level".
<b>Level Three Incident</b>	A hazardous materials incident which is beyond the controlling capabilities of a Hazardous Materials Response Team (Technician or Specialist Level) whose qualifications are explained in 8 CCR 5192, or California Government Code, Chapter 1503; and/or requires the use of two or more Hazardous Materials Response Teams; and/or must be additionally assisted by qualified specialty teams or individuals.
<b>Local Disaster Plan</b>	A plan developed and used by local government for extraordinary events.
<b>Local Emergency Planning Committee (LEPC)</b>	A committee appointed by a State emergency response commission, as required by SARA Title III, to formulate a comprehensive emergency plan for its corresponding Office of Emergency Services mutual aid region.

<b>Lower Explosive Limit (LEL)</b>	The lowest concentration of the material in air that can be detonated by spark, shock, or fire, etc.
<b>Material Safety Data Sheet (MSDS)</b>	A document which contains information regarding the specific identity of hazardous chemicals, including information on health effects, first aid, chemical and physical properties, and emergency phone numbers.
<b>Mitigation</b>	Any action employed to contain, reduce, or eliminate the harmful effects of a spill or release of a hazardous material.
<b>Mutual Aid</b>	An agreement to supply, if available, specifically agreed upon aid or support in an emergency situation between two or more agencies, jurisdictions, or political sub-divisions without the expectation of reimbursement.
<b>Narcosis</b>	Stupor or unconsciousness produced by chemical substances.
<b>National Fire Protection Association (NFPA)</b>	An international voluntary membership organization to promote improved fire protection and prevention, establish safeguards against loss of life and property by fire, and writes and publishes the American National Standards.
<b>National Institute for Occupational Safety and Health (NIOSH)</b>	A Federal agency which, among other activities, tests and certifies respiratory protective devices, air sampling detector tubes, and recommends occupational exposure limits for various substances.
<b>National Response Center (NRC)</b>	A communications center operated by the United States Coast Guard headquarters located in Washington, DC. They provide information on suggested technical emergency actions, and must be notified by the spiller within 24 hours of any spill of a reportable quantity of a hazardous substance.
<b>Necrosis</b>	Death in a particular part of a living tissue.
<b>Nephrotoxic</b>	A substance that negatively affects the kidneys.
<b>Neurotoxic</b>	A substance that negatively affects the nervous system.
<b>Occupational Safety and Health Administration (OSHA)</b>	Component of the United States Department of Labor; an agency with safety and health regulatory and enforcement authorities for most United States industries, businesses and States.
<b>On-Scene Coordinator (OSC)</b>	As explained in the National Contingency Plan, it is the pre-designated Federal official who coordinates Federal activities at a hazardous material incident, and monitors the incident for compliance with Federal pollution laws.
<b>Operations</b>	The coordinated tactical response of all field operations in accordance with the Incident Action Plan.
<b>Oxygen Deficiency</b>	A concentration of oxygen insufficient to support life.
<b>Oxygen Deficient Atmosphere</b>	An atmosphere that contains an oxygen content less than 19.5 % by volume at sea level.

<b>Pallets</b>	A low portable platform constructed of wood, metal, plastic, or fiberboard, built to specified dimensions, on which supplies are loaded, transported, or stored in units.
<b>Parts Per Million (ppm)</b>	A unit for measuring the concentration of a particular substance equal to one (1) unit combined with 999,999 other units.
<b>Pathogen</b>	Any disease producing organism, including viruses.
<b>Penetration</b>	The movement of liquid molecules through a chemical protective clothing, suit, garment or material.
<b>Permeation</b>	The movement of vapor or gas molecules through a chemical protective garment material.
<b>Permissible Exposure Limit (PEL)</b>	The employees' permitted exposure limit to any material listed in Table Z-1, Z-2, or Z-3 of OSHA regulations, section 1910.1000, Air Contaminants.
<b>Personal Protective Equipment (PPE)</b>	Equipment provided to shield or isolate a person from the chemical, physical, and thermal hazards that may be encountered at a hazardous materials incident. Adequate personal protective equipment should protect the respiratory system, skin, eyes, face, hands, feet, head, body, and hearing. Personal protective equipment includes- personal protective clothing, self contained positive pressure breathing apparatus, and air purifying respirators. (NFPA 472, 1-3)
<b>Pesticides</b>	A chemical or mixture of chemicals used to destroy, prevent, or control any living organism considered to be a pest.
<b>pH</b>	A numerical designation of the negative logarithm of hydrogen ion concentration. A pH of 7.0 is neutrality; higher values indicate alkalinity and lower values indicate acidity.
<b>Plume</b>	A vapor, liquid, dust or gaseous cloud formation which has shape and buoyancy.
<b>Poison Control Centers</b>	California is served by four certified and designated regional poison control centers. Each PCC is available 24 hours a day and can provide immediate health effects, scene management, victim decontamination, and other emergency medical treatment advice for hazardous materials emergencies. A physician specializing in medical toxicology is available for back-up consultation.
<b>Radioactive</b>	The spontaneous disintegration of unstable nuclei accompanied by emission of nuclear radiation.
<b>Radioactive Material (RAM)</b>	Any material, or combination of materials, that spontaneously emits ionizing radiation and has a specific activity greater than 0.002 micro curies per gram. (49 CFR 173.389)
<b>Rescue</b>	The removal of victims from an area determined to be contaminated or otherwise hazardous by appropriately trained and equipped personnel.

<b>Residue</b>	A material remaining in a package after its contents have been emptied and before the packaging is refilled, or cleaned and purged of vapor to remove any potential hazard.
<b>Response</b>	That portion of incident management where personnel are involved in controlling a hazardous material incident. (NFPA 472, 1-3)
<b>Safety Officer</b>	Selected by the Incident Commander, a person at an emergency incident responsible for assuring that all overall operations performed at the incident by all agencies present are done so with respect to the highest levels of safety and health. The Safety Officer shall report directly to the Incident Commander.
<b>Scenario</b>	An outline of a natural or expected course of events.
<b>Scene</b>	The location impacted or potentially impacted by a hazard.
<b>Self Contained Breathing Apparatus (SCBA)</b>	A positive pressure, self-contained breathing apparatus (SCBA) or combination SCBA/supplied air breathing apparatus certified by the National Institute for Occupational Safety and Health (NIOSH) and the Mine Safety and Health Administration (MSHA), or the appropriate approval agency for use in atmospheres that are immediately dangerous to life or health (IDLH). (NFPA 1991, 1-3)
<b>Sheltering In Place/In Place Protection</b>	To direct people to quickly go inside a building and remain inside until the danger passes.
<b>Short Term Exposure Limit (STEL)</b>	See Threshold Limit Value –Short Term Exposure Limit (TLV-STEL).
<b>Site</b>	Any facility or location within the scope of 8 CCR 5192(a)(3).
<b>Sludge</b>	Accumulated solids, semisolids, or liquid waste generated from wastewaters, drilling operations, or other fluids.
<b>Solubility</b>	The ability or tendency of one substance to blend uniformly with another.
<b>Staging Area</b>	The area established for temporary location of available resources closer to the incident site to reduce response time.
<b>State Warning Center (OES Warning Center)</b>	The Governor’s Office of Emergency Services Warning Center facilitates emergency communications with government agencies at all levels. The Warning Center monitors seismic activity, weather and other conditions that could cause a disaster and is the central reporting office for any release or threatened release of a hazardous material. The Warning Center is the initial point in the state where coordination begins to mobilize federal, state and local agencies during a disaster.
<b>Synergistic Effect</b>	The combined effect of two chemicals which is greater than the sum of the effect of each agent alone.
<b>Systemic</b>	Pertaining to the internal organs and structures of the body.
<b>Team Leader</b>	See Entry Team Leader.
<b>Technical Specialist -- Hazardous Materials Reference</b>	Person assigned to document activities of the Hazardous Material Team and gather information relevant to the chemicals involved and their hazards.

<b>Termination</b>	That portion of incident management where personnel are involved in documenting safety procedures, site operations, hazards faced, and lessons learned from the incident. Termination is divided into three phases- Debriefing, Post-Incident analysis, and Critique. (NFPA 472, 1-3) (See Post-Incident Analysis.)
<b>Threshold Limit Value (TLV)</b>	The value for an airborne toxic material that is to be used as a guide in the control of health hazards and represents the concentration to which nearly all workers may be exposed 8 hours per day over extended periods of time without adverse effects.
<b>Toxic</b>	Poisonous; relating to or caused by a toxin; able to cause injury by contact or systemic action to plants, animals or people.
<b>Traffic Control/Crowd Control</b>	Action(s) by law enforcement to secure and/or minimize exposure of the public to unsafe conditions resulting from emergency incidents, impediments and congestion.
<b>Treatment</b>	Any method, technique, or process which changes the physical, chemical, or biological character or composition of any hazardous waste, or removes or reduces its harmful properties or characteristics for any purpose.
<b>United Nations (UN) Identification Number</b>	When UN precedes a four-digit number, it indicates that this identification number is used internationally to identify a hazardous material.
<b>Upper Explosive Limit (UEL)</b>	The highest concentration of the material in air that can be detonated.
<b>Vapor</b>	An air dispersion of molecules of a substance that is normally a liquid or solid at standard temperature and pressure.
<b>Vulnerability</b>	The susceptibility of life, the environment, and/or property, to damage by a hazard.
<b>Warm Zone</b>	The area where personnel and equipment decontamination and hot zone support takes place. It includes control points for the access corridor and thus assists in reducing the spread of contamination. This is also referred to as the “decontamination”, “contamination reduction”, “yellow zone”, or “limited access zone” in other documents. (NFPA 472, 1-3)

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