Mass Casualty Guidelines for Hazardous Materials Incidents

GOALS
The goal of this procedure is to ensure a safe, effective, and unified approach to CBNRE incidents. In doing so, first responders seek to:

- Save lives,
- Minimize risk to the general public and emergency personnel, and
- Minimize secondary impact of CBRN agents.

DESCRIPTION
Initial Response Plan for Ambulatory Victims
Firefighters need to respond to HazMat and WMD incidents according to standardized procedures. These procedures allow responding companies to begin operations based on existing systems and without specialized equipment. They also allow for the modular expansion of operations as a situation evolves into regional deployed Nor-E decontamination systems.

First Arriving Engine Companies
This procedure stresses the need for prudence when responding to calls reporting suspicious circumstances or symptoms. Engine companies always approach such an incident from uphill, upwind, and upstream. Responders are also trained to take precautions against the possibility of secondary devices at suspicious incident scenes. The company officer is responsible for several actions, including:

- **Size-up the scene:** An initial assessment of the scene is made from a distance to determine if a potential chemical incident exists and whether the department's fundamental hazardous materials response plan needs to be implemented. The company officer relays his assessment to dispatch.

- **Request additional resources:** Additional resources are also requested through dispatch at this time based on the first arriving officer's observations. Directions for the next arriving companies are also conveyed, including how to approach the scene and where to stage resources.

- **Stage the engine:** The first arriving company stages its engine far enough from the incident scene that responders will not be contaminated by harmful agents. The company positions the engine so that next arriving companies can form decontamination corridors with their apparatuses. This procedure calls for decontamination engine to park parallel to each other, spaced apart at 12-14 feet intervals.

- **Establish zones:** While some crew members establish a safe refuge area and begin emergency decontamination of patients, others establish contamination zones using equipment on the apparatus (e.g., cones, tape). The crew distinguishes between the exclusionary zone (or "hot zone"), contamination reduction zone (or "warm zone"), and operational zone (or "cold zone").

- **Establish a safe refuge area for ambulatory patients:** The first arriving company communicates with patients as soon as possible using bullhorns or public address (PA) systems on the apparatus. Firefighters direct those who can walk to a safe refuge area just inside the warm zone, separating ambulatory from non-ambulatory patients.

- **Start emergency decontamination:** While awaiting backup resources, firefighters from the first arriving company begin emergency decontamination using hose lines to wet down ambulatory patients.

Rescue of Viable Non-Ambulatory Victims

Once mass decontamination of ambulatory victims has begun, then it is reasonable to assume that the officer in charge of the ICS would further identify, to the extent possible, all hazardous conditions present in the hot zone and shall implement appropriate emergency operations, and assure that the personal protective equipment worn is appropriate for the hazards deemed likely to be encountered. This hazard/risk assessment should be based upon information such as:

- Assessment of on-scene observations
- Victim signs and symptoms
- Bystander information
- Available intelligence
- Recommendations of reference materials, in particular the NA Emergency Response Guidebook, and
- Any other readily available information

After completing this assessment the incident commander can make a risk/benefit decision that a successful life saving rescue is feasible with the use of readily available personal protective equipment.

It is not the intent of this document to prohibit such a risk/benefit decisions provided that the decision is based upon an initial hazard/risk assessment of this nature.

However, anytime it is deemed probable that a hostile environment is present, personnel must immediately reframe from or disengage from such rescue efforts and await appropriate law enforcement assistance.

Next Arriving Fire Companies

Other fire companies arrive according to a graduated response system.

Set-up mass decontamination corridors: As additional engine companies arrive, they form additional decontamination corridors by positioning apparatus parallel and 12-14 feet apart from each other. Apparatus are positioned so that engineer panels face outside the corridor, allowing operators to access them without disrupting mass decontamination operations. Water is pumped at approximately 50 degree fog pattern and 50 PSI through fog nozzles affixed to discharges inside the corridor or handlines or ladder pipes.

Begin mass decontamination of ambulatory patients: Firefighters instruct ambulatory patients to enter the decontamination corridor, remove outer clothing, and place clothing in

clear plastic bags provided by firefighters. Patients are then instructed to rinse thoroughly for at least one minute. They are provided modesty wear in the form of disposable coveralls or black plastic garbage bags with head- and arm-hole cutouts.

Set-up triage areas and begin triage: Triages patients in mass casualty incidents (MCIs) according to the Simple Triage And Rapid Treatment (START) system. Firefighters establish an area for each level of START triage and assist medical personnel in directing patients to the appropriate area.

Establish incident command post (ICP): The IC establishes an ICP at a safe distance from the incident scene. When law enforcement and public health responders arrive on scene, they join the battalion chief at the ICP and operate under Unified Command. Proper notifications are made to hospitals and other officials at the local, state, and federal levels.

Establish Multi-Casualty Branch: Once patients are decontaminated, responders follow operational procedures for an MCI. Medical personnel treat patients according to their triage classification. Ambulances transport patients to hospitals accordingly. Decontaminated patients that do not require medical treatment are kept in a shelter area away from decontamination and medical operations where they are monitored by medical personnel for delayed onset of signs and symptoms. They are removed from the scene as quickly as is reasonable.

Establish ancillary positions: Next arriving companies also establish stations for responder services. Stations such as for refilling bottled air, medical support, and rehabilitation allow responders to continue extended operations.

Integrate HazMat Operations: When hazardous materials assets arrive they will perform further Hazard/risk assessments and extract non-ambulatory patients that are deemed not accessible to first responding units do to unacceptable risk/benefit analysis. HazMat teams perform their intended functions while decontamination is carried out by the initial or subsequent responding decontamination resources.

Regional Decontamination Resources

The next phase involves the deployment of regional decontamination resources equipped with standardized mass decontamination assets. These resources provide increased capacity and specialized capability through equipment and personnel trained in its use.

Resources
Orange County deploys resources to augment incident scene operations during a major chemical incident in two ways:

- **Equipment**

- **Trained personnel:** Each trailer and truck is accompanied by an MMRS strike team of 5 engine companies and one strike team leader (for a total of twenty-one firefighters) trained to operate the equipment and integrate into incident operations already underway. This creates a greater personnel pool to assist operations at the incident scene.

Enhancements: The equipment and personnel augment incident scene operations in three main areas:

- **First responder enhancements:** MMRS resources enhance the ability of first responders to operate in a WMD environment by providing specialized equipment for non-ambulatory decontamination. Teams integrate non-ambulatory decontamination equipment with ongoing ambulatory decontamination operations. Other equipment provided includes solutions for decontamination, additional personal protective equipment (PPE) for responders, respiratory protection, detection capability, modesty wear, and equipment changeover capability. MMRS also provides equipment for post-decontamination operations, including air shelters (easy ups), heaters, blankets, lights, and generators. MMRS decontamination enhancements are also available to augment operations at healthcare facilities throughout the county.

- **Medical enhancements:** Medical operations are augmented by pharmaceuticals (e.g., chemical agent antidote Mark 1 kits containing atropine and 2PAM), treatment area demarcation (tarps), and medical supplies.

- **HazMat enhancements:** HazMat teams receive additional agent detection equipment, PPE, and technical references. MMRS personnel provide assistance notifying appropriate agencies and organizations.

Law Enforcement

The primary responsibility of law enforcement personnel during a chemical incident is to provide force protection for firefighters, HazMat technicians, EMTs, and other first responders operating at the incident scene. Law enforcement maintains order and prevents disruptions to emergency operations both in the contamination reduction (warm) zone and the operations (cold) zone.

Emergency operations for law enforcement personnel include:

- **Perimeter:** The initial function of law enforcement personnel is to establish and maintain a safe and secure perimeter. This includes conducting street closure, evacuation, and traffic operations.

- **Decontamination:** During decontamination operations, law enforcement personnel provide force protection for firefighters. Law enforcement also conducts evidence collection and ensures crime scene preservation during decontamination. It is important to note that law enforcement personnel are trained to conduct these operations; this training includes an understanding that evidence collection and crime scene preservation are secondary to life-saving decontamination operations.

- **Triage:** As patients are triaged immediately following decontamination, law enforcement personnel help maintain order, direct ambulatory victims to proper medical treatment, and insure compliance.

- **Shelter:** Patients that are determined to require no medical treatment are sent to the shelter area. Law enforcement personnel conduct interviews and document their findings according to standard operating procedures.

- **ICP:** Law enforcement agencies send their incident commanders to participate in UC at the ICP. Other law enforcement personnel conduct security for the ICP.

- **Hazardous Materials:** Certain law enforcement personnel in the county are trained to operate in an exclusionary (hot) zone. These officers work in conjunction with HazMat teams to gather information and observations from the hot zone. They report their findings back to the ICP.

Phase 1: Baseline Deployment – 4 Personnel + Supervisor

1. Deploy ground pads to form a 40’ x 40’ base area

2. Deploy 10’ x 20’ shelter lengthwise on left side of the base area facing the incident.

3. Deploy 2- 10’ x 10’ shelters to the immediate right of the first shelter

4. Install center side walls by:
    a. Installing 1 – 10’ x 20’ sidewall on the right side of 10 x 20 shelter

5. If allowed by time or if necessary due to weather:
    a. Install outer sidewalls now and fill weights of all side walls with water.
    b. If weather is extreme, stake tents with ropes and stakes

6. Install overhead plumbing and connect to water source

7. If necessary, install lighting

Phase 2: Ambulatory and non Ambulatory Work Areas - 2 persons each area and 1 supervisor

Non-Ambulatory System (1st Priority)	Ambulatory System

▪ Install large retention berm non-ambulatory side against the middle supports (allows walking area towards outside)
▪ Place center portion of roller system in center of berm with arrow facing in the direct of patient flow
▪ Place 2 – additional end sections of rollers in position
▪ Install color coded red and black hard plastic floor runners
▪ Attach 320 degree rinse wand (Halo) and attach to plumbing
▪ Attach 2 spare water nozzles.
▪ Set up berm "kick-stands"
▪ Attach sump pump with longest hose at lowest point in berm. Sump pump should be against the sidewall and electric run up the side wall.
▪ Attach splash guards
	▪ Install retention berm in middle of ambulatory system
	▪ Install 2 shower hanging rails
	▪ Place color coded floor plastic floor runners in berm. Do not use red or black. These colors should be used on the non ambulatory side.
	▪ Hang 4 shower stalls
	  Start at center wall and move out
	  Male, non-gender, non-gender, female
	  Windows facing cold zone
	  Connect walls to berms as installed
	▪ Install sump pump with shortest hose. Sump pump should be at the lowest area and against the side.
	▪ Place I-Decon Kits at hot side
	▪ Designate an area for personal belongings bags on the hot side.
	▪ Place large 85 gallon waste drum on cold side of for misc. waste materials.

Phase 3 – Initial Operations Start (4 - 6 Personnel + 1 supervisor)

All personnel in non-ambulatory decon area and the entrance attendant on the ambulatory side must be appropriately protected.

-- Dress in Splash Garment with surgical gloves under chemical resistant gloves. (Tape outer most gloves)
-- Use your own bunker boots or black PVC chemical resistant boots.
-- Use appropriate respiratory PPE. (generally PAPR with appropriate filter cartridge however, SCBA may be necessary)
-- 1 person assists ambulatory patients at entry and 1 person assists at exit
-- 2 persons initially assist with non-ambulatory and this gets increased to 4 with high demand

Phase 4 – Final Support Items

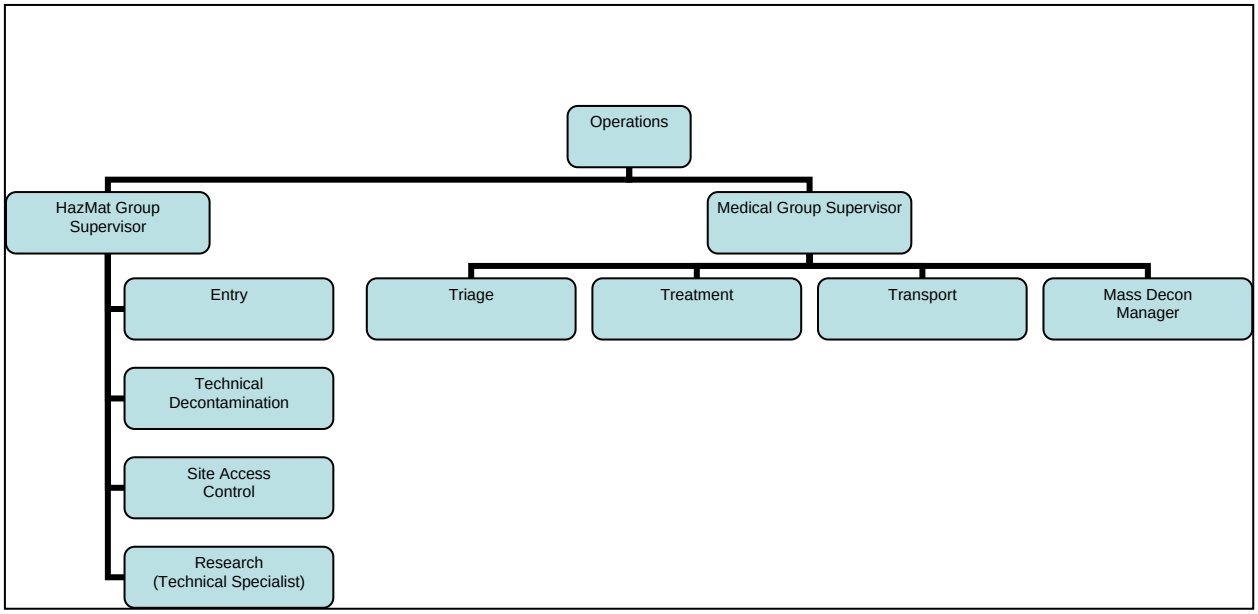
If decontamination operations are in progress, then PPE and Respiratory protection will be needed.

1- Install end wall on hot zone ends of non-ambulatory and ambulatory sides if necessary
2- Provide electric to sump pumps and connect gray-water tank
3- Install side walls on both ambulatory and non-ambulatory side if not already completed
4- Install lighting if needed and provide electric.

Staffing of Mass Decontamination Systems

The Nor-E decontamination systems currently within the state require a staffing level of no less 7 decontamination team personnel. In order to operate the system effectively it is intended to be augmented with additional operational level personnel as staffing will be rapidly expended in large operations.

Decontamination
Organizational
Chart



Decontamination Group Leader

1. Establish the contamination reduction corridor
2. Ensures all contamination reduction areas are clearly marked and communicated to the organizational structure.
3. Coordinates with Research and Safety to determine appropriate decontamination process
4. Identify contaminated persons and equipment
5. Supervise operations of the decontamination areas to possibly include emergency, technical and mass decontamination procedures
6. Maintain control and movement of personnel and victims through decontamination
7. Maintains communications and coordinates with the entry coordinator and, when implemented, safe refuge area manager and site access control leader
8. Coordinate movement of decontaminated patients to the control of the Medical Group
9. Coordinate handling, storage and transfer of contaminates within the contamination reduction zone
10. Maintain Unit/Activity Log (ICS 214) and Decontamination Plan

Technical Decontamination Manager

1. Establishes and manages the technical decontamination corridor
2. Maintains responder flow through the technical decontamination corridor
3. Ensure personnel operating in decontamination maintain appropriate PPE
4. Requests or directly obtains resources necessary for the operation of decontamination
5. Rotates operating personnel as necessary

Mass Decontamination Team Leader

1. Coordinates the deployment of the mass decontamination system
2. Communicates and coordinates with Medical Group concerning patient flow and discharge to Medical Triage
3. Prioritizes the set up of ambulatory and non-ambulatory sides
4. Ensures the proper flow of patients through the process
5. Ensure that an area and method for the collection and protection of personal belongs is established
6. Requests resources necessary to staff and operate the mass decontamination area effectively
7. Provides for the rotation of personnel
8. Minimizes environmental and health impacts through control of decontaminated materials, personnel and waste materials

Ambulatory Entry Attendant (1 – 2 persons)

1. Wears PPE and respiratory equipment appropriate for the hazards (generally level C)
2. Hands out a explains the use of the IDECON package
3. Directs victims to proper ambulatory stall and coordinates flow of patients
4. Has the victims hand the bag of clothing back out to the hot side and secures those belongs in a safe area. (Note: flow and control of personal belongings will be determined based upon material involved, level of contamination and level of evidentiary control required)
5. Facilitate patient flow through the ambulatory side in achieve maximum capacity

Ambulatory Discharge Attendant (1-2 persons)

1. Assists ambulatory patients out of the discharge side of ambulatory decon
2. Monitors for remaining contamination on patients as deemed necessary for the incident. If unacceptable contamination remains then return patient to entry side of decontamination
3. Ensures no un-authorized materials level the decontaminated area.
4. Collects and remaining waste or trash and has it placed in the over-pack drum
5. Coordinates the flow of patients to the Medical Group

Non-Ambulatory Decontamination Team Member (3-4 persons)

1. Transition the patient off the stretcher and onto the roller system
2. If patient is on a back-board but DOES NOT require immobilization, then remove them from the back-board to the roller system to facilitate greater cleaning
3. Cut-away contaminated clothing
4. Provide head-to-toe soap and water wash
5. Rinse the patient through the “rinse-halo”
6. Process the patient off the roller system and discharge to the medical group

Supporting Documentation

Nor-E Users manual
Best Practices Manual for Mass Decontamination