MABAS 54 HAZARDOUS MATERIALS RESPONSE TEAM

DECONTAMINATION POLICY & PROCEDURES

PURPOSE

The purpose of the contamination reduction procedure is to assure that any potentially harmful or dangerous residues on persons, equipment, or apparatus are confined within the Hot Zone. Contamination reduction is intended to prevent the spread of contaminants beyond the defined area - particularly to avoid carrying contaminants back to the fire station or to other environments.

All personnel should make every effort to avoid contaminating themselves and equipment.

PROCEDURE

The specific measures required to decontaminate personnel, equipment, or apparatus will vary with the contaminant, the circumstances, and the level of contamination. These factors must be considered on a case-by-case basis within the guidelines described in this procedure.

Command is responsible for assuring that a Decontamination Sector is implemented at incidents which involve a potential decontamination problem. This sector should be assigned to personnel from the Hazardous Materials Response Team. It must be integrated into the management of the Hot Zone.

The Decontamination Sector officer is responsible for determining the most appropriate contamination reduction procedures and managing the contamination reduction process. This should be done in conjunction with advice from the Poison Control Center and or the Health Department when applicable.

The initial assessment of decontamination requirements must be based upon the specific needs of the situation and take into account the specific methods. The assessment will require research and may involve consultation (i.e. the shipper, manufacturer, CHEMTREC).

The Decontamination Sector officer must assume that all personnel and equipment leaving the Hot Zone are contaminated. Three courses of action are available:

i. Confirm not-contaminated - using instruments or investigation based on the nature of the situation.
ii. Decontaminate (as appropriate to the situation) and release.
iii. Retain and package items for removal from the site for disposal or decontamination at a different location.

In all cases the primary objective must be to avoid contaminating anyone or anything beyond the Hot Zone. When in doubt about contamination, decon all affected personnel, equipment, and apparatus.

The Contamination Reduction Corridor should be established within the Warm Zone perimeter adjacent to the entrance/exit (Lobby Control). Personnel, equipment, and apparatus shall not be permitted to leave the Hot Zone without approval from the Decontamination Sector officer.

The contamination reduction area should provide a corridor leading away from the source of contamination toward the exit (contamination reduction corridor) with stations along the way for the deposit of tools, equipment, protective clothing, and other items. Monitoring personnel and equipment should be appropriately placed along the path.

A person traveling along the path should experience a decreasing level of contamination along the way. When showers or spray nozzles are used, adequate space must be provided to avoid contamination of other areas or persons.

All contaminated items must remain within the perimeter of the Hot Zone until decontaminated or safely packaged for removal. The Hazardous Materials Sector officer or Decontamination Sector officer will be responsible for supervising proper removal of these items. Personnel should be assigned to inspect persons and/or equipment before they can be released from the Decontamination Area. This inspection may be visual or may involve the use of the monitoring instruments, when available. It must be assumed that items or persons are contaminated, unless their non-contamination can be confirmed.

DECONTAMINATION AREA PRECAUTIONS

During the decontamination process, all personnel working in the Decontamination Area must be adequately protected from contaminants. The Decontamination Sector officer will identify and require the appropriate protective equipment. These individuals and their equipment may also require decontamination after use.

Any runoff or residue from decontamination procedures must be contained within the Hot Zone and retained for proper disposal. Contaminated runoff must not be allowed to spread or escape. Diking may be necessary and should be directed back to the Hot Zone.

CONTAMINATED PATIENTS

Patients in need of medical treatment should be removed from the source of contamination as quickly as possible, but remain within the Hot Zone perimeter. These patients must not be allowed to contaminate further areas or persons. It may be necessary to bring treatment personnel (with adequate protective clothing) into the Hot Zone to deal with these patients, unless they can be rapidly and effectively decontaminated. After decontamination, the patients and treatment personnel may leave the Hot Zone. Most situations will allow for treatment of contaminated patients in a separate treatment area in the Warm Zone adjacent to the Cold Zone.

TRANSPORTATION

Transportation of Immediate patients should not be delayed for complete decontamination. Patients should be quickly treated for life-threatening injuries simultaneously with decontamination efforts. Once treatment is completed and the patient is ready for transport, the patient should be covered and transported. The ambulance should be brought to the Warm Zone perimeter for loading. When feasible, the ambulance should be prepared by draping exposed surfaces with sheets or polyurethane covers. Patients should be wrapped or covered to lessen off-gassing of the products within the ambulance.

If it is necessary to transport contaminated patients to medical facilities, the receiving hospital must be notified in advance of the nature of the contamination, in order to make necessary preparations. The ambulance used will be considered contaminated and will have to be decontaminated before being used to transport any non-contaminated persons. Helicopters will not be used for transporting any contaminated patients due to off-gassing effects on the pilot and flight crew.

DECONTAMINATED PERSONS

When persons are decontaminated at a contamination reduction area, they may be released to leave the Warm Zone. This includes Fire Department personnel, other emergency personnel, civilians, and patients.

The Decontamination Sector officer will determine when it is appropriate to release custody of protective clothing, personal effects, and equipment after consulting appropriate medical personnel (i.e., health center physician or Poison Control Center physician). The Decontamination Sector officer may release individuals who are substantially decontaminated and direct them to medical facilities for further evaluation or decontamination. Individuals may also be directed DECON 54 to shower, change clothes, or take other secondary decontamination measures.

Fire Department personnel should complete an exposure form. The health center's exposure control officer will initiate contact and follow-up measures.

PROTECTIVE EQUIPMENT/PERSONAL EFFECTS

When feasible, protective clothing and personal effects should be decontaminated and released from the Warm Zone with the individual. If the Decontamination Sector officer determines this is not feasible, these items will be impounded in the Decontamination Area. Personal effects will be carefully guarded by Decontamination Sector personnel until a determination can be made regarding their final disposition.

TOOLS AND EQUIPMENT

The Decontamination Sector officer will determine when tools, equipment, and apparatus may be released from the Hot Zone. No item shall be removed without approval. The Decontamination Sector officer may impound equipment for later evaluation and have it packaged for storage or transportation. This impoundment will be accomplished following the consultation of medical and technical assistance.

DECONTAMINATION PROCEDURES

Decontamination by removing clothes and flushing or showering with water is the most expedient and the most practical method for mass casualty decontamination. Disrobing and showering meets all the purposes and principles of decontamination. Showering is recommended whenever liquid transfer from clothing to skin is suspected. Disrobing should occur prior to showering for chemical agents; however, the decision to disrobe should be made by the Incident Commander based upon the situation. Wetting down casualties as they start to disrobe speeds up the decontamination process and is recommended for decontaminating biological or radiological casualties. However, this process may:

- Force chemical agents through the clothing if water pressure is too high
- Decrease the potential efficacy of directly showering skin afforded by shear forces and dilution
- Relocate chemical agent within the actual showering area, thereby increasing the chance of contamination spread through personal contact and shower water runoff.

The Haz-Mat Team recommends that victims remove clothing at least down to their undergarments prior to showering. Victims should be encouraged to remove as much clothing as possible, proceeding from head to toe. It is also recommended that emergency responders use a high volume of water delivered at a minimum of 60 pounds per square inch (psi) water pressure (standard household shower pressures usually average between 60-90 psi) to ensure the showering process physically removes viscous agent. The actual showering time will be an incident-specific decision but may be as long as two to three minutes per individual under ideal situations. When large numbers of potential casualties are involved and queued for decontamination, showering time may be significantly shortened. This may also be dependent upon the volume of water available in the showering facilities. In the course of deconning victims, first responders may inadvertently become contaminated. High-pressure, low-volume decontamination showers are recommended primarily for wet decontamination of emergency responders in Level A suits after a Haz Mat incident. This gross decontamination procedure forcibly removes the contaminant from the personal protective equipment (PPE) worn by the emergency responders while conserving water. Often a secondary wash, and possible a tertiary wash, and rinse station are used.

MASS DECONTAMINATION

Decontamination must be conducted as soon as possible to save lives. Firefighters should use resources that are immediately available and start decontamination as soon as possible. Since they can bring large amounts of water to bear, the most expedient approach is to use currently available equipment to provide an emergency low-pressure deluge.

The following forms of water-based decontamination were considered:

- Water alone. Flushing or showering uses shear force and dilution to physically remove chemical agent from skin. Water alone is an excellent decontamination solution.
- Soap and water. By adding soap, a marginal improvement in results can be achieved by ionic degradation of the chemical agent. Soap aids in dissolving oily substances like mustard or blister agent. Liquid soaps are quicker to use than solids, and reduce the need for mechanical scrubbing; however, when scrubbing, potential victims should not abrade the skin. A disadvantage of soap is the need to have an adequate supply on hand. Additionally, extra time may be spent employing it, and using soap may hydrate the skin, possibly increasing damage by blister agents.
- Bleach and water. Bleach (sodium hypochlorite) and water solutions remove, hydrolyze, and neutralize most chemical agents. However, this approach is not recommended in a mass decontamination situation where speed is the paramount consideration for the following reasons:
- Commercial bleach must be diluted and applied with equipment not generally available to firefighters.
- Skin contact time is excessive. Laboratory studies show that chemical agents and relatively nontoxic, aqueous decontaminants may need to be in contact for durations longer than expected shower durations for significant reaction to occur.
- Laboratory studies suggest that bleach solutions at the 0.5% level may not be better than flushing with water alone.
- Medically, bleach solutions are not recommended for use near eyes or mucous membranes, or for those with abdominal, thoracic, or neural wounds.

In summary, the issues associated with the use of soap and bleach solutions include time delay, dilution and application, medical contraindications, and its efficacy compared to water. These limitations make the use of soap or bleach solutions less desirable than using water alone.

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