

3. EMERGENCY MEDICAL SUPPORT

3.1 Introduction

Coordination is critical between the planners responsible for the medical emergency plan and the emergency planners responsible for the comprehensive Emergency Management Program. Each group has information and skills essential to the success of the other group. The plans should be developed and reviewed in concert to ensure an integrated approach.

Since few, if any, DOE sites maintain the full range of medical capabilities available in the surrounding community, injured employees will be transferred to offsite facilities when the medical condition allows. The surrounding community may also provide capabilities and resources that reinforce onsite capabilities. A close working relationship is necessary to ensure that medical support is provided seamlessly during an emergency.

By using the results of the Hazards Survey and/or Hazards Assessment, medical and emergency planners should be able to develop a tailored system to protect the health and safety of DOE workers and the public. The availability of medical capabilities and resources within the surrounding community should be closely examined. There will likely be situations where the probability of a particular service or resource being needed, combined with the confidence the service or resource is available in the surrounding community, indicate that it is more cost effective to develop agreements to use the offsite capabilities rather than develop a redundant capability at the DOE facility. There are other situations where DOE facilities will have unique expertise that is not readily available within the surrounding community. This Guide encourages using the most effective approaches to meeting DOE O 151.1 requirements.

Base Program. DOE O 440.1 is the replacement directive for DOE 5480.8A. DOE O 440.1 establishes requirements for facility and site medical programs within Section 18 of the contractor requirements document. Most medical situations will fall within the scope of the program established to meet these requirements. The *Accreditation Manual* of the Joint Commission on Accreditation of Healthcare Organizations, Federal Ambulance Specifications, 29 CFR 1910.151, and NFPA 99 will likely be used, in addition to DOE O 440.1, to define facility/site medical programs.

DOE O 440.1 Contractor Requirements Document, Section 18.h., directs the physician responsible for providing medical services to develop the medical portion of the “site emergency and disaster plan.” DOE O 151.1 defined the interface between the medical plan and the emergency plan as situations with mass casualties. Mass casualty situations were chosen as the interface point because they are characterized by the marshaling of

resources from a variety of sources. In order to ensure the health and safety of the injured, these actions must be well planned, practiced, and controlled. The base program provides the framework to coordinate planning, preparedness, and response actions.

Section 3.2 discusses the characteristics of mass casualty incidents and identifies areas that should be addressed by medical and emergency planners, working in concert.

3.2 Mass Casualty Incidents

3.2.1 Definitions

There are definitions, such as those contained in the Brady *Paramedic Emergency Care* text, that define the severity of a mass casualty incident. The following definition (drawn from Butman) is not meant to replace those definitions. Instead, it is to help personnel identify mass casualty incidents.

The difference between a mutual aid response and a mass casualty incident will depend on factors that are subjective and highly specific to each DOE facility and its surrounding community.

A **mutual aid response** will normally be characterized by three conditions:

- (1) Facility first responders and facility Emergency Medical Service personnel being able to mitigate life threatening injuries in all victims to the same level that they would be able to mitigate similar injuries in a single victim;

AND

- (2) Within 10 to 20 minutes, enough other responders and ambulances can be at the site to provide normal levels of care and transportation;

AND

- (3) The hospitals that can be reached within the normally accepted time for transport of patients can provide adequate stabilization until definitive care can be provided.

In general, the quantity of personnel and resources *ultimately* available is insufficient in a mass casualty situation. Only those personnel and resources that are available within the time allowed by standard medical treatment protocols are of value. Plans that enlarge the pool of available personnel and resources are not sufficient if there are time problems and the triage principle must be employed.

Therefore, a **mass casualty incident** exists when:

- (1) The number of patients and the nature of their injuries make the normal level of stabilization and care unachievable;

AND/OR

- (2) The number of Emergency Medical Service personnel that can be brought to the site within the time allowed is not enough;

AND/OR

- (3) The stabilization capabilities of the hospitals that can be reached within the time allowed are insufficient to handle all the patients.

3.2.2 Initial Phase

By definition, the initial phase of a mass casualty incident will have more patients than available facilities or personnel can properly treat. Planning for such instances shall be coordinated with offsite authorities; DOE O 440.1 requires that the medical plan be compatible with the offsite plan. Site planning should be well-coordinated with offsite emergency management organizations as well, since offsite emergency organizations could be activated to assist the site or because of the large geographic impact of a natural phenomena event. Capabilities, resources, and activation procedures should be worked out in advance. The goal should be to have considered likely scenarios and developed decision aids to simplify the process of getting the injured to medical treatment facilities in the most expeditious manner.

At many DOE sites, security is a paramount concern. While these are valid concerns, they can sometimes impact the rapid provision of emergency medical services. Rapid treatment is especially critical in trauma or cardiac situations. Sites should evaluate security systems and develop emergency ingress/egress procedures to allow for rapid access of emergency medical responders, their vehicles, and equipment to critically injured or ill patients. Emergency ingress and egress procedures should also consider how best to use offsite responders, while accommodating security concerns.

Communications equipment should be compatible with offsite agency frequencies. There should be at least one joint user/mutual aid frequency available on all communications equipment to simplify inter-agency communications. Should the state have a designated emergency medical service frequency, that frequency should be included on site emergency medical service radios.

Since mass casualty incidents are likely to require the coordinate efforts of several agencies, there should be an established mechanism for identifying patients and recording the medical facility to which the patient has been transported.

Mass casualty situations and emergencies involving casualties may involve situations where teams must reenter dangerous environments to evacuate casualties. Rescue teams are formed by a variety of organizations for these purposes. The primary responsibilities of rescue teams are: provide immediate life saving aid during day-to-day operations; remove victims from dangerous scenes (e.g., fires, accidents) or contaminated areas; remove gross contamination, if present and possible; and transfer the victim to medical personnel.

Rescue Team size, staffing, and training should be based on the potential threats outlined in the Hazards Survey. Rescue Teams can be composed of personnel with a range of backgrounds but should have at least one medically trained individual (i.e. First Responder, Emergency Medical Technician, etc.) per team. Rescue Teams should receive any specialized training necessary for the potential threats. This training may consist of, but is not limited to hazardous materials (HAZMAT), confined space rescue, and high angle rescue. If the facility chooses to use offsite rescue teams, the facility must ensure that the offsite teams are trained in the peculiar hazards at the facility. Also see Volume IV, Chapter 2.

Site emergency medical service personnel are normally found in the site's fire department or occupational medicine department. In some cases, the security or protective force department also has emergency medical service personnel. Regardless of how the organization is structured, the site Medical Director should specify minimum standards for training and equipment for all emergency medical personnel. Site standards for training and equipment should be compatible with similar offsite standards, if not the same as offsite standards.

3.2.3 Follow-On Activities

After casualties have been evacuated from the incident scene, other activities and services may need to be activated before the emergency is terminated. These activities and services should not require the same level of pre-planning as characterizes planning for the initial phase of a mass casualty incident. The emergency plan should identify how necessary services and capabilities can be accessed.

There could be fatalities; some possible scenarios could result in mass fatalities. Planning should consider legal requirements for handling of remains, as well as identify mortuary capabilities to handle to large numbers of fatalities. A massive structural collapse could

result in requirements for urban search and rescue that exceed the capabilities of facility rescue teams. Many scenarios could result in requirements for critical incident stress management services for the emergency responders themselves. There are national programs that provide assistance in all these areas; there could be regional, state, or local programs, as well. Consideration should be given to accessing these established capabilities, if it is more cost effective.

3.3 Hazardous Material Program

The Hazards Assessment that must be developed for those facilities subject to the requirements of Chapter IV, DOE O 151.1, will provide further details on the potential scenarios and numbers of contaminated, injured workers at the facility. This information is critical to ensure that adequate facilities and equipment are available to provide medical care to the injured workers, while minimizing the impact of the contamination.

3.3.1 Offsite Interface

Contaminated, Injured Personnel. An important consideration is the offsite emergency medical service and local medical facility's ability to handle contaminated patients. Procedures and decision criteria for transport and treatment of contaminated, injured patients should be developed in advance, with consideration given to the capabilities of all organizations, as well as the legal and financial implications of various options. Procedures should, at a minimum, address contaminated patient transportation; equipment use and disposition; contamination control; and decontamination of patients, equipment, and facilities.

Radiological Emergency Assistance Center/Training Site (REAC/TS). REAC/TS provides treatment consultation services on a 24-hour basis as part of the Federal Radiological Assistance Program and serves as the primary source of medical expertise for DOE site-related injuries, as well as support to offsite agencies. (Also see Volume VIII.)

REAC/TS has a number of courses to prepare medical personnel to cope with contaminated patients in both the pre-hospital setting or clinical facility. Other industrial and academic sources throughout the country provide training and information for coping with these patients. DOE emergency medical personnel should contact these institutions for additional information. Also, NCRP Report #65 provides information on contaminated patient care.

3.3.2 Facilities

Decontamination centers for treating radiologically or chemically contaminated individuals, detecting and minimizing the spread of contamination, and decontaminating medical equipment (e.g., ambulances, defibrillators, cots) should be established as part of the medical facility or as a stand-alone facility. As a minimum, they should include the following elements.

- A designated contaminated patient entrance and procedures to restrict spread of contamination.
- An area equipped for removing and disposing of readily transferable contamination.
- Showers for contaminated patients, including means by which to control and collect contaminated water or materials.
- Radiation survey instruments and decontamination supplies.
- Showers and change rooms for medical and health protection personnel, including means by which to control and collect contaminated water or materials; dedicated ventilation system.
- If applicable, capability to perform chelation therapy treatment for patients with transuranic contamination.
- Antidotes and/or chemical burn treatments, as appropriate, for hazardous material contaminated patients.
- Record keeping materials for recording treatment and extent of contamination and exposure.

(Also see the Volume IV, Chapter 5.)

3.3.3 Equipment

Medical personnel are responsible for assessing patient condition, providing necessary emergency medical care, and determining needs for further medical care. Equipment needs should be based on the Hazards Survey, Hazards Assessment, and the appropriate Standard of Care. NFPA Standards 1991, 1992, and 1993 provide information on HAZMAT clothing and equipment that emergency medical service personnel may need if

they are members of site HAZMAT teams or participate in HAZMAT operations. NFPA Standard 1999 provides information on emergency medical service protective clothing. (Also see the Volume IV, Chapter 5.)

Radiation/Health Protection and Industrial Hygiene personnel assist medical personnel and should have the necessary equipment for surveying patients, providing decontamination advice, assisting in contamination and exposure control, and assisting medical personnel in accomplishing urine analysis, fecal analysis, in-vivo counting, and radiochemical analysis for contaminated patients.

3.3.4 Services

Procedures for handling and disposing of contaminated remains should be developed and coordinated with local medical facilities, medical examiner's offices, and funeral directors. Some considerations are decontamination procedures; monitoring, packaging, and transporting the remains; and documentation of the actions taken.

The National Foundation for Mortuary Care and Department of Defense publications and personnel may be available to provide advice and assistance in this area.

3.3.5 Preparedness Activities

OSHA Regulations (29 CFR 1910.120) require that personnel who may be exposed to hazardous materials during an emergency response receive specialized training. DOE site emergency medical directors have an obligation to ensure that offsite emergency medical service personnel who may respond to assist at a DOE site have received the necessary training prior to being placed in a situation that could expose them to hazardous materials. Additionally, offsite emergency medical service responders should be provided with any necessary specialized training unique to a DOE site response. Refer to NFPA 473, Volume V, Chapter 4; Volume X, HAZWOPER Emergency Response; and Volume III, Chapter 2 for additional information.

3.4 Bibliography

DOE O 151.1 Chg 2. *Comprehensive Emergency Management System*. August 21, 1996.

DOE O 440.1 Chg 2. *Worker Protection for DOE Federal and Contractor Employee*. October 21, 1996.

Title 29 CFR 1910. *Occupational Safety and Health Standards*.

Title 29 CFR 1910.120. *Hazardous Waste Operations and Emergency Response*.

Federal Specifications Ambulance (Emergency Medical Care Vehicle). Specification KKK-A-1822D. General Services Administration.

Accreditation Manual. Joint Commission on Accreditation of Healthcare Organizations.

Management of Persons Accidentally Contaminated With Radionuclides. NCRP Report #65.

NFPA 99. *Standard for Health Care Facilities*. National Fire Protection Association.

NFPA 473. *Professional Competence for EMS Personnel Responding to Hazardous Materials Incidents*. National Fire Protection Association. 1997.

NFPA 1991. *Standard on Vapor-Protective Suits for Hazardous Chemical Emergencies*. National Fire Protection Association.

NFPA 1992. *Standard on Liquid Splash-Protective Suits for Hazardous Chemical Emergencies*. National Fire Protection Association.

NFPA 1993. *Standard on Support Function Protective Clothing for Hazardous Chemical Operations*. National Fire Protection Association.

NFPA 1999. *Standard on Protective Clothing for Emergency Medical Operations*. National Fire Protection Association.

Brady. *Paramedic Emergency Care*, 2nd Edition.

Butman, Alexander M. 1982. *Responding to the Mass Casualty Incident*, Akron, Ohio, Emergency Training.