

Ambulance Guidelines for Response to Radiation Events



This page intentionally left blank

Ambulance Guidelines for Response to Radiation Events

Prepare, Respond, Recover

Task Force Committee Members

John Celentano, MD

Task Force Co-Chair
Disaster Medical Officer
Los Angeles County EMS Agency

Mike Short

Task Force Co-Chair
Battalion Chief
Los Angeles County Fire Department

Randy Alva

Battalion Chief
Los Angeles County Fire Department

Greg Chidley, EMT-B

Chief, Ambulance Services
Los Angeles County EMS Agency

Terry Crammer, RN

Disaster Training Specialist
Los Angeles County EMS Agency

Jerry Crow, RN

Mobile Medical Systems Program Lead
Los Angeles County EMS Agency

Jeffrey Day, RPT

Director, Radiation Management
Los Angeles County Public Health

James Eads, EMT-P

Chief, Disaster Response
Los Angeles County EMS Agency

Juan Gonzalez

Battalion Chief, Hazmat, Ret
Los Angeles County Fire Department

Milo Gonzalez

Health HazMat
Los Angeles County Fire Department

Lyle Hanson, EMT-B

Division Director
Care Ambulance

William Koenig, MD

Medical Director
Los Angeles County EMS Agency

Victor Nanadiego

Health HazMat
Los Angeles County Fire Department,

Joseph Patricko

Principal Radiation Protection Specialist
Los Angeles County Public Health

Gregory Reynar

Assistant Chief
Los Angeles Fire Department

Advisor:**L. Robert Greger**

Senior Health Physicist
California Department of Public Health
Radiological Health Branch

This page intentionally left blank

Ambulance Guidelines for Response to Radiation Events

Prepare, Respond, Recover

Table of Contents

Background.....	1
Purpose	1
Introduction	1
Overview	2
Summary of Radiological Hazards.....	3
Assumptions.....	5
Ambulance Ownership.....	6
Prepare Phase.....	7
Equipment	7
Personal Protective Equipment (<i>Go Kit</i>)	7
Training.....	8
Response Phase	9
First responders	9
Dispatch.....	9
Arrival at scene.....	10
Triage (Medical and Radiological considerations)	10
Prehospital Actions	10
Arrival at the hospital.....	12
After patient transfer (Perform Self Decon)	12
Arrival back at the scene	13
Special circumstances	13
Recovery Phase.....	15
Demobilization of ambulances.....	15
Demobilization of personnel.....	15
Crew illness	16
Crew concerns.....	16
Cost recovery for ambulances removed from service	16
Appendices	17

Ambulance Guidelines for Response to Radiation Events

Prepare, Respond, Recover

Appendix A – Sample - Triage Tag.....	19
Appendix B – Sample - Prehospital Radiological Treatment Protocol	21
Appendix C – Sample – Window Placard	23
Appendix D – Sample – Employer’s Doffing Instructions.....	25
Appendix E – Just In Time Training (JITT) card for transporting radiation contaminated patients ..	27
Appendix F – Frequently Asked Questions (FAQs).....	30
Appendix G –Stay Time Table	32
Appendix H – Sample – Public Decontamination Instructions.....	34
Appendix I – Public Assistance for Ambulance Services	36
Appendix J – Acronyms and Abbreviations	40
Appendix K – Sample – MCI Field Decontamination Guidelines.....	42
Appendix L – Responder Equipment Contamination Release Levels.....	44
References.....	46
Web Resources	50

|

Ambulance Guidelines for Response to Radiation Events

Prepare, Respond, Recover

Background

Purpose

To provide a consensus guidance document that may be used by ambulance services owners/operators to prepare for, respond to, and recover from, a radiological incident.

This document is intended for informational use only and **SHOULD NOT BE USED** as the sole source of developing policies or procedures within any organization. Further research, discussion and advice should be obtained from qualified professionals to help guide the development of emergency response plans.

Introduction

There are numerous research facilities and firms that legally possess and use radiological materials. Additionally there are radioactive materials that are legally transported throughout the operational area. All of these activities are regulated, and closely monitored. However, there is always a remote potential for an accidental or intentional act that releases radioactive materials, and individuals within the community might be exposed or contaminated by these materials

The Los Angeles County Emergency Medical Services (EMS) Agency researched literature, and determined that there was a general lack of available guidance and information for ambulance owners and operators (EMS field personnel) to review and prepare for the field care management and transportation of patients that may have been exposed to various radiological isotopes from either an accidental or intentional release such as a nuclear reactor release or a radiological dispersal device (RDD or “dirty bomb”).

The EMS Agency directed that a task force of subject matter experts convene to examine the issue and develop a guidance document that addresses the concerns and issues that may arise as a result of this type of incident. This document is a product of that task force. It is a living document that may be modified as additional facts are identified and experience gained that supports improving the way management of such incidents occurs.

Ambulance Guidelines for Response to Radiation Events

Prepare, Respond, Recover

The information obtained, developed and released in this guidance document may be used in future training and exercise endeavors by EMS partners throughout the Los Angeles County operational area.

Overview

It is a national consensus that victims who have life- threatening injuries and are contaminated with radiological material should receive emergency care before decontamination considerations. In other words “treatment of significant medical conditions should always take precedence over radiological assessment or decontamination of the patient.” (ACR, 2006)

It is also clear that life-threatening traumatic injuries are best treated in the hospital setting. “Survival rates will decrease if transportation is constrained by policies imposed by EMS, ambulance providers and medical facilities that will not transport and/or accept potentially contaminated patients.” (Homeland Security Council, 2009)

These two factors have led many to question: What would happen to the ambulance and crew that were involved in an event where radiologically contaminated patients are transported in the ambulance thus potentially exposing the crew and vehicle to radioactive contamination?

A specialized task force comprised of experts from various disciplines met over a period of several months to examine overlapping issues, discuss management strategies and define answers to this question in order to develop an end product that provides guidelines that may be implemented in response to radiological contamination events.

Disciplines represented included Health Physicists, Emergency Physicians, Emergency Medical Technicians, Registered Nurses, Hazardous Materials Specialists, Ambulance Administrators and Chief Officers. These individuals represented public and private ambulance services, fire department, public health, emergency medical services and hospitals.

The final draft document was then vetted to private and public 9-1-1 transporting ambulance departments (6 Private + 25 Public) , departments with Hazardous Materials Response Units (16 units), fire departments, Radiation Management Division of Los Angeles County Department of Public Health, Los Angeles County Department of Health Services- Emergency Medical Services Agency, Los Angeles County Fire Department-Health Hazmat, local ambulance association and other interested

Ambulance Guidelines for Response to Radiation Events

Prepare, Respond, Recover

stakeholders within the Operational Area (OA). After a 30 day review and comment period this consensus document was finalized to provide guidance on actions to be taken by ambulance transport units before, during and after a radiological event.

Incident Characteristics

Incidents covered by this document include:

- Radiological Exposure Device (RED): A simple radiological device designed to expose people to radiation. Exposure only, **no contamination** present. Small number of victims.
- Radiological Dispersal Device (RDD): A sprayer, a conventional explosive device with radiological contaminants present, or any device that can disperse radioactive material. Contamination will vary by device and source. Small to large number of victims.
- Nuclear reactor damage: Small to large number of victims.
- Radiological accident: Materials that either expose or contaminate individuals. Small to large number of victims.

Incidents **NOT** covered by this document include:

- Improvised Nuclear Device (IND), and Strategic Nuclear Weapon (SNW)

It was the decision of the task force to focus on the more likely event to affect our community. Although it is plausible to have an IND or SNW event, the task force felt that an IND and SNW event would have a different type of operational response requiring different types of resources, training and equipment with a broader scope of overhead management. Therefore, it was decided to defer this discussion to a later time.

Summary of Radiological Hazards

Humans have lived and evolved in an environment containing ionizing radiation from their beginnings. The natural radioactive environment in which we live today results in approximately 310 mrem (3.1 mSv) radiation dose per year in the U.S. This is from cosmic radiation, radioactive material in the soil, radioactive material in one's own body, and inhaled radon that is emitted from radioactive material in the soil. Technological developments result in an additional approximately 310 mrem (3.1 mSv) per year, primarily from medical tests and treatments with only a few mrem per year from non-

Ambulance Guidelines for Response to Radiation Events

Prepare, Respond, Recover

medical technologies. Thus totaling an annual average background dose of 620 mrem (6.2 mSv) per person living in the United States (NCRP Report No. 160)

The average doses noted can vary somewhat depending on the location at which one lives, works, or travels. For example, living in Denver compared to living near sea level will result in an additional approximately 25 mrem (0.25 mSv) per year due to less atmospheric shielding of cosmic radiation. Similarly, airplane travel increases one's radiation dose (from cosmic radiation), as does living in regions of the U.S. that have higher natural soil radioactivity.

The primary health risk of ionizing radiation is that it is cancer causing. What isn't conclusively known is whether exposure to low levels of radiation causes cancer. Most of our data today on ionizing radiation's cancer-causing property is derived from high doses experienced in the Japanese atomic bomb detonations and some other events that resulted in relatively high doses of radiation. This data has demonstrated that radiation doses of somewhere between 10,000 and 20,000 mrem (in a short-time interval) and above have caused increased cancer risks. While not known to be the case, it is conservatively assumed that any radiation is cancer causing, and that the chance of cancer is directly proportional to the total radiation dose received.

The increased cancer risk per 1000 mrem (10 mSv) of radiation dose is assumed to be 0.1 % based on extensive studies of the atomic bomb survivors and some other relatively high dose situations. This means that the average lifetime cancer risk of approximately 45% for males and 40% for females theoretically increases to 45.1% and 40.1%, respectively for men and women, per 1000 mrem (10 mSv) radiation dose. The annual allowed radiation dose for radiation workers is 5000 mrem (50 mSv) per year, which would theoretically increase the cancer risk by 0.5% per year worked at the maximum allowed radiation worker dose. Actual radiation doses to workers only rarely exceed 1000 mrem (10mSv) per year. Several studies of large numbers of radiation workers have been conducted, but none have conclusively confirmed an increased cancer incidence for radiation workers.

It is not expected that radiation doses to ambulance workers would exceed 100 mrem (1 mSv) (likely much lower) from treating and transporting injured people in a radiological contamination event, primarily because the radiation dose from contaminated persons is relatively low. One hundred (100) mrem (1 mSv) per year is the regulatory dose limit prescribed for members of the public. The primary radiation risk from contaminated persons is from ingestion and inhalation of radioactive material. Radioactive material on people is dispersed similarly to dust and dirt on them would be, and common precautions of removing their outer clothing and/or putting a sheet over

Ambulance Guidelines for Response to Radiation Events

Prepare, Respond, Recover

them will result in greatly reduced risk of spread of radioactive contamination from them, and therefore the risk to ambulance personnel of ingestion or inhalation of the radioactive contamination.

Most radioactive contamination is very easily detected at levels far below that which would present a significant hazard to people, meaning that simply because radioactive contamination is detected on people is not indicative of a need to be overly concerned for its health impact to them or to others. While it is always good to be cautious around radioactive materials, such cautiousness should not preclude providing necessary treatment of people's medical injuries. Simple precautions, such as wearing disposable gloves, outer clothing, and an N-95 or N-100 filter mask, while observing normal personal hygiene habits, will greatly minimize ambulance personnel radiation exposures.

Assumptions

The recommendations in this guidance document are based on the following assumptions:

- Ambulances may be called to respond to a radiological event
- **LIFE THREATENING MEDICAL CONDITIONS TAKE PRIORITY OVER CONTAMINATION ISSUES**
- Ambulance crews will operate within the Incident Command System
- In a known radiological event, there will be "experts" on scene, such as, HazMat, Health HazMat, and paramedics. These experts will help triage and handle contaminated patients before ambulance crews have to transport the patients to the hospital
- Ambulances may have to transport contaminated patients, but most are expected to be decontaminated at the scene
- Ambulance crews may be exposed to low levels of radiation from contaminated patients
- Ambulances may become contaminated
- Ambulances and crews may have to be decontaminated
- Ambulances may not always be able to be decontaminated
- Majority of the hospitals in our OA (85 of 102) have a mechanism in place to take care of radiologically contaminated patients once they arrive at their facility
- Radiologically contaminated victims may self-transport and converge on hospitals with little or no notice

Ambulance Guidelines for Response to Radiation Events

Prepare, Respond, Recover

Ambulance Ownership

Ambulance Owners/Operators, whether operated by a County, a City or a private company, need to understand that this type of event may happen and what consequences are associated with such an event. However, this type of event can be managed properly with some simple training, and minimal equipment purchases.

Operators should consider establishing agreements or working relationships with a hazardous waste clean-up company. The Conference of Radiation Control Program Directors (CRCPD) maintains a list of approved firms that provide radioactive waste broker and decontamination services, which can be accessed at: www.crcpd.org/stateservices/commercialservices/radwastebroker/services.pdf

Partners from United States Department of Energy (DOE), United States Environmental Protection Agency (EPA) and United States Department of Defense (DoD) may all be involved in a national incident, regardless of cause, to help clean up the incident site and equipment.

Ambulance Guidelines for Response to Radiation Events

Prepare, Respond, Recover

Prepare Phase

Equipment

Ambulances should stock the following items for immediate response which would be beneficial to minimize the spread of contamination within the cabin of the ambulance www.atsdr.cdc.gov/MHMI/mhmi-v1-3.pdf , Page 57.

- Six (6) –millimeter plastic sheets to place on floors and to hang from ceiling, cover seats and exposed surfaces such as cabinets
- Duct tape to seal off and attach plastic sheets
- Disposable water resistant sheets/blankets (Cotton sheets can be used but will need to be discarded at hospital)
- Box of plastic trash bags to contain PPE and other contaminated items
- Ability to regulate or stop airflow to the patient care cabin
- Just In Time Training cards (Appendix E)
- Wet wipes or hand towels with a bottle of soap and water
- Container of “window chalk” or premade six inch (6”) letter C’s (Appendix C)

NOTE: Currently there are no recommendations on the type of paint or other materials that could be used that would provide any form of protection or improved decontamination capabilities.

Personal Protective Equipment (Go Kit)

- Tyvek® type one piece over garment with built in hood and booties, preferably water resistant (minimum 4 sets)
- Examination gloves (several boxes)
- N-95 or N-100 Filter Mask (minimum 4)
- Goggles (minimum 2 pair)
- Over booties (minimum 4 pair)

(NOTE: Los Angeles County Prehospital Reference 710, Basic Life Support Ambulance Equipment requires the stocking of minimum quantity of PPE, which currently is about half of these supplies)

Ambulance Guidelines for Response to Radiation Events

Prepare, Respond, Recover

Training

- All personnel that might be involved in transporting radiologically contaminated patients, should have proper training in the following:
 - Overview of Ambulance Guidelines for Response to Radiation Events
 - Basic Radiological Principles
 - Radiological detection devices
 - Risks from radiation
 - Contamination versus Exposure
 - Minimizing exposure techniques
 - How to don and doff appropriate PPE
 - Small versus large scale response
 - Basics of the Emergency Response Guide
 - Current National, State and Local policies related to treatment and transport of radiological contaminated patients
- A standardized “Ambulance Response to a Radiological Event” class will be between 1-2 hours long and can be presented in whole or in modules as determined by the Owner/Operators.
- Just In Time Training (JITT) Card (Appendix E)
 - JITT card will be given to each crew member as part of their initial training and will also be available in each ambulance (*Go Kit*)
 - JITT card will be abbreviated reminders of key actions and information

Ambulance Guidelines for Response to Radiation Events

Prepare, Respond, Recover

Response Phase

First responders

The fire department will respond to all incidents with characteristics stated above. They will assess the scene and begin monitoring for radiation. They will set up a perimeter to deny entry to those not in appropriate PPE, set up the ICS, contact dispatch and ask for additional resources, such as HazMat.

Once ICS is established, paramedics or HazMat are on scene, the Medical Alert Center (MAC)* must be contacted. Additionally, the Radiation Management Division of Los Angeles County Department of Public Health must be contacted either through the MAC or through fire dispatch.

The MAC should be notified as soon as possible in order to provide surrounding hospitals with adequate warning of possible contaminated convergent patients.

*The Medical Alert Center is dedicated to providing valuable, knowledgeable, and skilled resources to coordinate and support County patient transfer services, multiple casualty incidents, and **disaster response activities**.

Dispatch

Ambulance crews will be notified in several ways that they are responding to a radiological event:

- 1) Through 9-1-1 or departmental dispatch, or
- 2) Through regional dispatch as part the Emergency Overflow Agreement (EOA) or
- 3) Upon arrival at the scene. (Not ideal, but possible)

If dispatched, ambulances should be provided a staging area location, free of radioactive contamination, when possible (Support Zone). The Emergency Response Guidebook (ERG) is useful as a guide, if available. This guidebook can be downloaded at: phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Hazmat/ERG2012.pdf

Ambulance Guidelines for Response to Radiation Events

Prepare, Respond, Recover

Arrival at scene

- Ambulance loading should be located in the Support Zone as defined in the Los Angeles County Multi-Agency Radiological Response Plan. This is generally outside the limits of 2mR/hr. **NOTE: This area will be identified by HazMat or Radiation Management Division of Los Angeles County Department of Public Health once they have arrived.**
- Review their JITT Card (Appendix E).
- Ambulance crews should activate their departmental Emergency Response Plans (ERP) for a radiological incident.
- Follow the instructions provided by the on-scene Incident Commander (IC) or designee.
- Prepare ambulance and equipment according to their ERP.
- Don appropriate PPE according to the type of patient they will be transporting. Mask and eye protection are of the utmost importance.

Triage (Medical and Radiological considerations)

Paramedics on scene will determine medical triage category (Appendix A) while Health HazMat will determine level of radiological contamination of those remaining at the scene.

In the very rare event that Health Hazmat or another “qualified radiological surveyor” determines there is enough radiation on the patient to cause harm to first responders, that patient will either be decontaminated prior to transport or triaged accordingly.

Prehospital Actions (Appendix B)

- Asymptomatic and minimal exposure is suspected, victims can be released at scene
 - No EMS Transport
 - Instructions issued for at home decontamination (Appendix H)
- Not life threatening condition (Delayed and Minor)
 - Full decontamination at scene
 - Patient Radiation Monitoring will be done by Health HazMat or other qualified personnel at the scene to ensure victims are not a significant contamination risk
 - Patients with foreign bodies that cannot be removed safely and are left in place during patient transportation by first responder crews

Ambulance Guidelines for Response to Radiation Events

Prepare, Respond, Recover

- JITT card – will advise crew of Time and Distance techniques.
- Life Threatening (Immediate)
 - Provide basic first aid.
 - Outer clothing and personal belongings will be removed before transferring to ambulance. **NOTE:** Full decontamination can be done at the scene, **ONLY** if it does not delay transport.
 - Victim clothing that was removed should remain at the scene in a closed labeled plastic bag.
 - Cover gurney with a minimum of two (2) sheets (plastic or cotton).
 - Patient will be double wrapped in sheets by transporting crew to minimize contamination of the ambulance. Leave face exposed and gently wash with moist cloth/wet wipe.
 - Preferred sheets are disposable paper/plastic lined sheets. These will be disposed of at the hospital. Cotton/Linen sheets are acceptable but will also need to be disposed of at the hospital.
- Prior to departure the ambulance will be identified as a “contaminated ambulance”. This will be done in the following way:
 - At least one window on the sides and rear of the vehicle will be marked with a “C” for contaminated. These letters should be at least six inches (6”) tall and be clearly visible from 25 feet away. (Reflective material would be ideal)
 - Front view: The lower passenger side of the windshield shall have a “C” at least six inches (6”) tall and be clearly visible from 25 feet away or tape copies of Appendix C to inside of window.
- Health Hazmat or other “qualified radiological surveyor” will attach a “clean” dosimeter near the jump seat to monitor levels of radiation within the patient cabin area. This may not be available initially but be provided later in the response.
- Notify hospital, if not done so already, that they will be receiving radiological contaminated victims. Provide any radiological and medical information that is known. Provide an estimated time of arrival and ask for any instructions from the receiving facility they may have for the ambulance (i.e. special routes or procedures once the ambulance arrives at the hospital, etc.)

Ambulance Guidelines for Response to Radiation Events

Prepare, Respond, Recover

Arrival at the hospital

- Many hospitals, and all with emergency departments, have been trained to respond to a surge of patients with radiological exposure and/or contamination. They have had training that suggests that 80% of the victims from such an event could be self-referrals. They have also been trained that first responders could send them contaminated patients that have life threatening injuries or illness.
- It is the ambulance crew's responsibility to follow the hospitals procedures, if established, once on their grounds. This may involve following certain paths that have been created for clean versus contaminated patients. It is also the crew's responsibility to identify to staff the patient contamination status i.e. clean, decontaminated or contaminated.
- Hospitals will triage the incoming patient to determine if the patient should receive decontamination first or treatment first based on their triaged level of severity.

After patient transfer (Perform Self Decon)

- Crews will dispose of contaminated bedding and sheets that were used on the patient or gurney, into a plastic biohazard bag and then place that bag into another bag either clear or biohazard. This bag will remain in the contaminated area of the "Hospital Decontamination Zone."
- Crews will doff their PPE and place into a plastic biohazard bag and then place that bag into either a clear or biohazard bag. This bag will remain in the contaminated area of the "Hospital Decontamination Zone" (Appendix D for suggested doffing procedure)-Dry Decontamination.
- Crews will wash their hands with wet wipes or wash cloth with soap and water. Then wash around face with clean wipe/wash cloth.
- Crews will then don another set of PPE before returning to the ambulance.
- As a general precaution, personnel should refrain from eating, drinking, smoking, etc. while in a potentially contaminated area. **NOTE:** Heat exhaustion and dehydration are the primary causes of illness and injury when wearing PPE. Personnel should be conscientious to hydrate frequently, preferably in "clean" areas.

Ambulance Guidelines for Response to Radiation Events

Prepare, Respond, Recover

Arrival back at the scene

- Crews that are driving an ambulance identified as contaminated will be directed to stage in the designated contaminated ambulance staging area.
- Crews will receive a replacement (*Go Kit*)
- Health Hazmat or other “qualified radiological surveyor” will provide the following:
 - Screen the crew’s hands and face for any contaminants and make recommendations for decontamination, if present.
 - Screen the ambulance for contamination and determine if the vehicle is safe to remain in service. The levels will be determined by Stay Time Tables (Appendix G) and modified accordingly to operational considerations, such as, isotope, resources, number of victims, etc.
 - Check cabin dosimeter, if issued, to verify radiological exposure levels.

Special circumstances

- Private Residence
 - There may be a situation where an ambulance crew responds to a residence where a victim left the scene but now decides to call an ambulance or 9-1-1 for transport to the hospital. In this situation, follow normal procedures related to dispatch protocols.
 - If the person has **no medical life threatening condition**, but is possibly contaminated with radiological materials (history from patient or bystander), have the patient take a shower before transport and leave contaminated clothing in a closed labeled plastic bag that is placed in an uninhabited area of their residence.
 - If there is a **medical life threatening condition**, personnel should don a N-95 or higher mask, and don other appropriate PPE according to the type of patient they will be transporting (if not done already). Remove patients clothing at scene, as described above and try to prepare ambulance accordingly to minimize contaminates; however, **DO NOT DELAY TRANSPORT BECAUSE OF CONTAMINATION ISSUES.**
 - Notify dispatch and hospital of patient condition (medical and potential radiological contamination).

Ambulance Guidelines for Response to Radiation Events

Prepare, Respond, Recover

- Emergency Response (9-1-1)
 - Ambulances that arrive first on scene and identify there is a possible HazMat situation should immediately position themselves safely at least 150 feet upwind and uphill of the site.
 - Move uninvolved people away and deny entry, if this can be done by the crew safely.
 - Notify their dispatch center to ensure other first responders are aware of a possible HazMat incident.
 - Wait for other first responders to determine what type of hazard is present.
 - If hazard is identified as a radiological contaminant, follow procedures identified previously.

NOTE: The use of EMS helicopters for the transport of potentially contaminated victims is generally NOT APPROPRIATE and should only be used as a last resort. Rotary wash from a helicopter close to an incident will likely spread the contaminants even further. Also there is no guarantee that the vehicle can be safely returned to service, depending on the isotope and level of contamination.

In order to not overwhelm any one hospital, patient distribution will take both limiting contamination and distributing patient acuity into consideration. This will minimize the spread of contaminates throughout the community while maintaining safe patient care.

Ambulance Guidelines for Response to Radiation Events

Prepare, Respond, Recover

Recovery Phase

Demobilization of ambulances

- Vehicle crews will need to remove all contaminated items from the vehicle: Plastic sheets, blankets, etc. Crews can do this while in their own PPE.
- Dosimeters, if issued will be collected and checked.
- Health Hazmat or other qualified surveyor will check the vehicle for any remaining contamination.
 - An ambulance can be “free released” back to the provider agency or
 - An ambulance can be determined to be contaminated and will need to be decontaminated
 - Ultimately the decontamination will be the responsibility of the ambulance operator.
 - The location for storage of contaminated vehicles will be determined by the Incident Commander.
 - Fire Hazmat, Health Hazmat or another public agency may offer to decontaminate vehicles, if resources permit. Health HazMat will be responsible for identifying decontamination sites.
 - The Radiation Management Division of Los Angeles County Department of Public Health represents the State authority and will survey vehicles once they have been decontaminated and then authorize a “free release”
- See Los Angeles County Multi-Agency Radiological Response Plan- Table 11: Responder Equipment Contamination Release Levels (Appendix L).
- High use specialty equipment, like an ambulance, should be given priority attention for decontamination efforts to release back into service at the lowest contamination level reasonable.

Demobilization of personnel

- Personnel will doff any PPE they were wearing following recommendations from the on-site Decontamination Leader or designee.
- Health Hazmat or other qualified surveyor will survey personnel for any remaining contamination and make recommendations for decontamination, if necessary
 - Wipe hands and face as previously described with recommendation to take personal shower when able, or
 - Full decontamination at scene

Ambulance Guidelines for Response to Radiation Events

Prepare, Respond, Recover

Crew illness

- Personnel that get sick during the event should report to the Treatment Unit Leader or designee within the ICS structure.
- Personnel that get sick after the event should follow their employer's occupational health policies and procedures.
- It is not anticipated that radiation exposures would rise to the level that individuals would experience medical symptoms from the types of radiological incidents described in this document. However, any radiation doses of concern would be reported to the employer by the Radiation Management Division of Los Angeles County Department of Public Health.

Crew concerns

- Personnel who have been exposed to ionizing radiation may be concerned about the effects of their exposure. These concerns may be alleviated by an effective education program. Remember "...contamination of the magnitude necessary to produce (serious) health effects over a brief period of time is not likely to be seen on a live patient." (National Academy of Sciences, 1990)

Cost recovery for ambulances removed from service

- The American Ambulance Association has written several articles related to disaster cost reimbursement. Recommendations are:
 - Have good insurance and understand your policy coverage
 - Have a written agreement with your local, State or tribal government
- Federal Emergency Management Agency coverage is limited for private for profit ambulance providers. (Appendix I)

Appendices

This page intentionally left blank

Appendix A

(Sample-Triage Tag)

FRONT

BACK

**PERSONAL PROPERTY RECEIPT/
EVIDENCE TAG**

Destination _____
Via _____

TRIAGE TAG

☐ S ☐ L ☐ U ☐ D ☐ G ☐ E ☐ M
Saltwater Lacrimation Urination Dehydration G.I. Distress Emesis Miosis

AUTO INJECTOR TYPE _____
AUTO INJECTOR TYPE _____

Yes	No	Primary Injuries
Yes	No	Secondary Injuries
Injuries		
<input type="checkbox"/> Blast Trauma <input type="checkbox"/> Burn <input type="checkbox"/> C-Spine <input type="checkbox"/> Cardiac <input type="checkbox"/> Choking <input type="checkbox"/> Fracture <input type="checkbox"/> Laceration <input type="checkbox"/> Penetrating Injury		

VITAL SIGNS

Time	S/P	Pulse	Respirations
Time	Drug Solution	Dose	

MORGUE

IMMEDIATE 	IMMEDIATE
DELAYED 	DELAYED
MINOR 	MINOR

Comments/Information

Patient's Name _____

RESPIRATIONS **R** ☐ Yes ☐ No
PERFUSION **P** ☐ < 2 Sec ☐ > 2 Sec
MENTAL STATUS **M** ☐ Can Do ☐ Can't Do

Move the Walking Wounded ➔ **MINOR**

No Respirations After Head Tilt ➔ **MORGUE**

☐ Respirations - Over 30 ➔ **IMMEDIATE**

☐ Perfusion - Capillary Refill Over 2 Seconds ➔ **IMMEDIATE**

☐ Mental Status - Unable to Follow Simple Commands ➔ **IMMEDIATE**

Otherwise ➔ **DELAYED**

PERSONAL INFORMATION

NAME	
ADDRESS	
CITY	ST ZIP
PHONE	
COMMENTS	RELIGIOUS PREFERENCE

MORGUE
 Pulseless/Non-Breathing

IMMEDIATE Life Threatening Injury	IMMEDIATE Life Threatening Injury
DELAYED Serious Non Life Threatening	DELAYED Serious Non Life Threatening
MINOR Walking Wounded	MINOR Walking Wounded

CONTAMINATED

EVIDENCE

CONTAMINATED

EVIDENCE

<http://www.triagetags.com/>

This page intentionally left blank

Appendix B

(Sample-Prehospital Radiological Treatment Protocol)

DEPARTMENT OF HEALTH SERVICES
COUNTY OF LOS ANGELES

(PARAMEDIC, MICN)
REFERENCE NO. 1235

TREATMENT PROTOCOL: RADIOLOGICAL EXPOSURE

1. If radiation is suspected, confirm by using appropriate detection devices
2. If present, identify the cause of the contamination:
 - a. **Internal Radiation (Radiation Therapy)**
 - Begin treatment using appropriate treatment protocol based on complaints
 - Exposure to internal radiation poses low-to-no risk
 - b. **External Radiation**
 - Exposure through a Radiological Dispersal Device (RDD), Radiological Material Release (RMR) or Radiological Exposure Device (RED)
 - Exposure to victims from radiological dispersal devices poses low-to-moderate risk

If External Radiation, proceed with steps 3 through 9:

3. If MCI, begin triage (Ref. No. 519.2, MCI Triage Guidelines)
4. If a RDD is used and in the absence of any other information
 - Evacuate 1,650 feet in all directions from the detonation site
 - Follow the Emergency Response Guidebook for recommended evacuation perimeter zones. ①②
5. Notify: ③
 - Departmental hazardous materials (HazMat) team, if available
 - Department of Public Health (DPH) Radiation Management at (213) 974-1234, if departmental HazMat team is not available and prolonged exposures are expected
6. **ESTABLISH BASE CONTACT or**
IF MCI, CONTACT MEDICAL ALERT CENTER (MAC)

LIFE THREATENING CONDITION	NOT LIFE THREATENING CONDITION	ASYMPTOMATIC AND MINIMAL EXPOSURE IS SUSPECTED
<ol style="list-style-type: none">7. Treat using appropriate treatment protocol based on complaints8. All patients should be medically stabilized before radiation injuries are considered9. Remove the outer clothing and utilize contamination mitigation techniques before transport. Decontaminate at scene only if it does not delay transport.	<ol style="list-style-type: none">7. Decontaminate using departmental protocols; for extremely large incidents, it may not be necessary to contain the water runoff8. Treat using appropriate treatment protocol based on complaints	<ol style="list-style-type: none">7. Release and issue procedure for home decontamination. Simple external radiological exposure poses low risk.

SPECIAL CONSIDERATIONS

- ① Remember the following principles:
 - Time:* limit time with the victim to a minimum
 - Distance:* the further away from the source, the smaller the dose received.
 - Shielding:* "Turnouts" will protect from alpha and beta emitters, wear respiratory protection if particulate matter (i.e., dust or powder) is present
- ② Continued close exposure of provider for greater than 15 minutes, may require dosimetry and the establishment of dose guidelines.
- ③ The HazMat team or DPH Radiation Management will be able to redefine boundaries, establish radiation dose guidelines, assist with monitoring and decontamination procedures, and provide support to on-scene responders.

EFFECTIVE DATE: 7-1-12

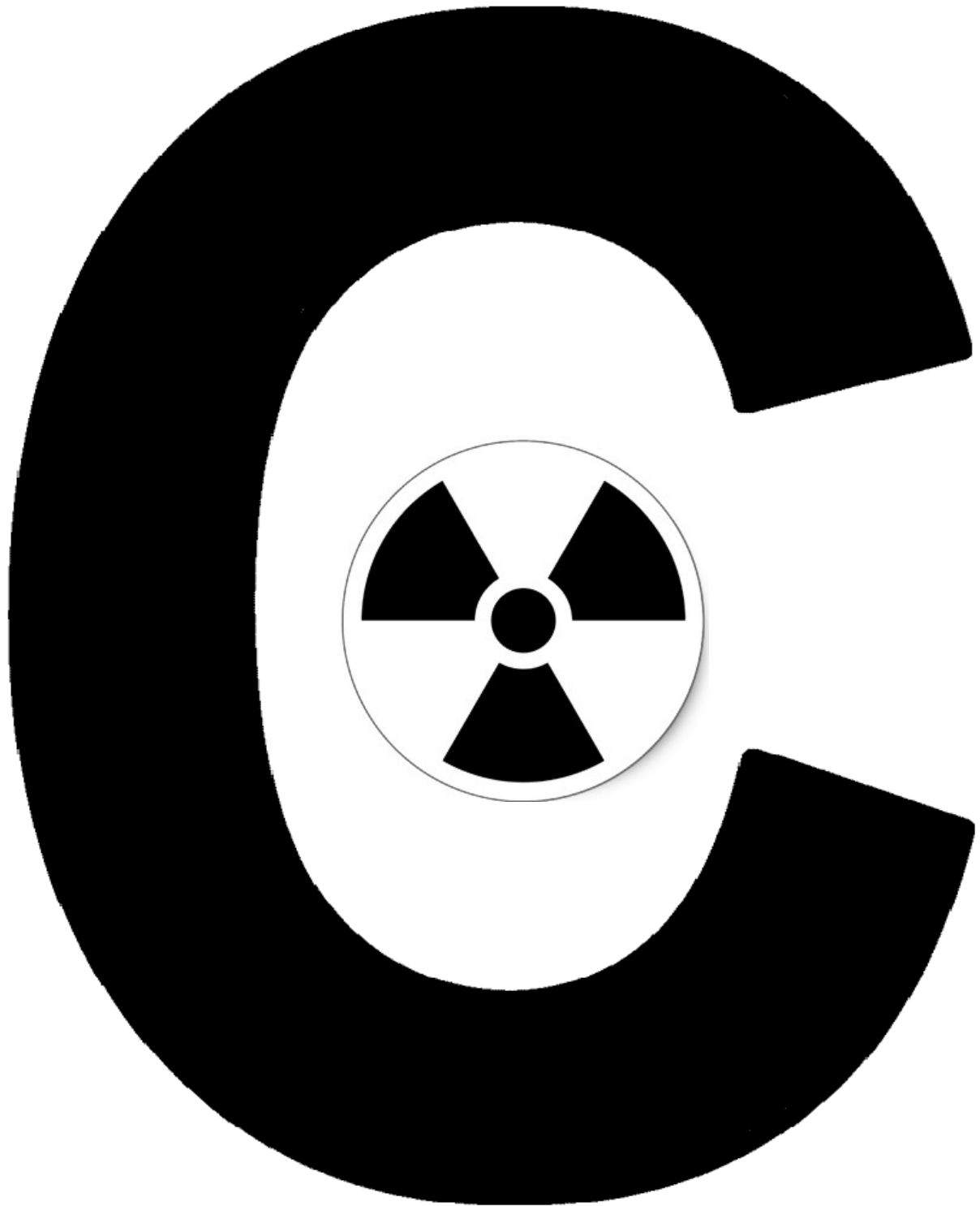
PAGE 1 OF 1

<http://ems.dhs.lacounty.gov/policies/Ref1200/1225.pdf>

This page intentionally left blank

Appendix C

(Sample-Window Placard)



This page intentionally left blank

Appendix D

(Sample-Employer's Doffing Instructions)

Place Employer's Doffing Instructions Here

This page intentionally left blank

Appendix E

Just In Time Training (JITT) Card for transporting radiation contaminated patients

Actions	Notes
Activate departmental Emergency Response Plans (ERP) for a Radiological Incident.	<ul style="list-style-type: none"> • Contact dispatch, if not done so already, to advise them of incident
Follow instructions provided by the on-scene Incident Commander (IC) or designee.	
Prepare ambulance and equipment according to their ERP	<ul style="list-style-type: none"> • Place plastic sheets on floors and hang from ceiling. • Place at least two sheets on gurney. • Turn down the heating/air conditioning fan to the patient care cabin to minimize the spread of contaminants. • Place a "C" on each window with "window chalk" or premade 6" letter C's • Attach dosimeter near the cabin jump seat, if one issued
Don appropriate Personal Protective Equipment (PPE) according to the type of patient you will be transporting	<ul style="list-style-type: none"> • Tyvek® type over garment, preferably water resistant • Examination gloves x 2 • N-95 or N-100 Filter Mask • Goggles • Over booties
Receive contaminated patient	<ul style="list-style-type: none"> • Double wrap patient in sheets leaving only necessary areas exposed to perform assessments or therapy. Cover patient back up once task is complete. Do not interfere with ABC's. • Any clothing removed should remain at the scene in a closed labeled plastic bag.
Practice ALARA principles during transport	<ul style="list-style-type: none"> • Minimize Time (moderately effective), increase working Distance (very effective), and Shielding (less practical)
Notify receiving hospital as soon as possible that you have a radiological contaminated patient	<ul style="list-style-type: none"> • The hospital may provide you special instructions such as a different entrance than normal • Notification helps hospital prepare before arrival
Transfer patient to hospital	<ul style="list-style-type: none"> • Keep patient wrapped in gurney sheets to minimize spread of contaminates
Doff PPE	<ul style="list-style-type: none"> • Follow departmental procedures for doffing • Clean hands with a clean "wet wipe" or hand towel • Clean face with a clean "wet wipe" or hand towel • Leave double bagged PPE at Hospital Decon Zone
Don second set of PPE and return to contaminated staging area	

Appendix E

Just In Time Training (JITT) Card for transporting radiation contaminated patients

This page intentionally left blank

Appendix F

Frequently Asked Questions (FAQs)

Q: Do crews have to respond?

A: Yes. Refer to the Emergency Operators Agreement (EOA)

Q: Who is purchasing the “Go Kit”?

A: The ambulance provider. However, most of the equipment needed would be the same if you had a contagious person that needed transportation.

Q: How will PPE be re-supplied during an event?

A: Although most if not all crews would only transport one or two patients, if more PPE is needed, it would be resupplied by the ambulance provider once a supervisor is on scene at the staging area.

Q: Who are “other qualified surveyors?”

A: It can be any number of personnel; Health Hazmat, Fire Hazmat, Public Health Radiological Management, Environmental Protection Agency personnel, Department of Energy personnel just to name a few. What will make them qualified is expertise on the survey equipment being used, a clear understanding of radiological dose effects on personnel and an understanding of federal, state and/or local policies and regulations regarding exposure limits.

Q: What happens if an ambulance is determined to be unsafe for further use?

A: In the rare event the contamination levels exceed safe operating limits established by qualified personnel on scene, the ambulance will be taken out of service for the remainder of the event until decontamination of such vehicle can take place.

Q: What kind of follow up will be done with personnel that were exposed to low levels of radiation?

A: No need for medical follow up based on radiation exposure is anticipated. Radiation levels will be monitored throughout the event and no personnel should be exposed to levels that exceed Federal, State or local policies or regulations. Employers may choose to develop their own policies and procedures, if they feel it is necessary.

This page intentionally left blank

Appendix G

(Stay Time Table)

STAY TIME TABLE

		DOSE													
		All Emergency Responder Activities Under the Emergency Conditions				Protect Property	Life-Saving		Life-Saving Volunteers Only		Potentially Lethal				
DOSE RATE (Gamma Rate on Meter)		100 mrem 0.1 rem	1,000 mrem 1 rem	2,000 mrem 2 rem	5,000 mrem 5 rem	10,000 mrem 10 rem	20,000 mrem 20 rem	25,000 mrem 25 rem	50,000 mrem 50 rem	100,000 mrem 100 rem	200 rem LD 50	300 rem LD 50	500 rem LD 50	1,000 rem LD 100	
Bkg	10 µR/h	10000 h													
Above Background	50 µR/h	2000 h													
	100 µR/h	1000 h	10000 h	20000 h											
	500 µR/h	200 h	2000 h	4000 h	10000 h										
	750 µR/h	133 h	1333 h	2666 h	6666 h										
SET UP HOT LINE CAUTION	1000 µR/h 1 mR/h	100 h	1000 h	2000 h	5000 h	10000 h									
	2 mR/h	50 h	500 h	1000 h	2500 h	5000 h	10000 h	12500 h							
	5 mR/h	20 h	200 h	400 h	1000 h	2000 h	4000 h	5000 h	10000 h						
	7.5 mR/h	13 h	133 h	266 h	666 h	1333 h	2666 h	3333 h	6666 h						
	10 mR/h	10 h	100 h	200 h	500 h	1000 h	2000 h	2500 h	5000 h	10000 h					
WORK IN HOT ZONE DANGER	20 mR/h	5 h	50 h	100 h	250 h	500 h	1000 h	1250 h	2500 h	5000 h	10000 h				
	30 mR/h	3 h	33 h	66 h	166 h	333 h	666 h	833 h	1666 h	3333 h	6666 h	10000 h			
	40 mR/h	150 min	25 h	50 h	125 h	250 h	500 h	625 h	1250 h	2500 h	5000 h	7500 h			
	50 mR/h	120 min	20 h	40 h	100 h	200 h	400 h	500 h	1000 h	2000 h	4000 h	6000 h	10000 h		
	75 mR/h	80 min	13 h	26 h	66 h	133 h	266 h	333 h	666 h	1333 h	2666 h	4000 h	6666 h		
	100 mR/h	60 min	10 h	20 h	50 h	100 h	200 h	250 h	500 h	1000 h	2000 h	3000 h	5000 h	10000 h	
	200 mR/h	30 min	5 h	10 h	25 h	50 h	100 h	125 h	250 h	500 h	1000 h	1500 h	2500 h	5000 h	
	300 mR/h	20 min	3 h	6 h	16 h	33 h	66 h	83 h	166 h	333 h	666 h	1000 h	1666 h	3333 h	
	400 mR/h	15 min	150 min	5 h	12 h	25 h	50 h	62 h	125 h	250 h	500 h	750 h	1250 h	2500 h	
	500 mR/h	12 min	120 min	4 h	10 h	20 h	40 h	50 h	100 h	200 h	400 h	600 h	1000 h	2000 h	
DANGER	750 mR/h	8 min	80 min	160 min	6 h	13 h	26 h	33 h	66 h	133 h	266 h	400 h	666 h	1333 h	
	1000 mR/h 1 R/h	6 min	60 min	120 min	5 h	10 h	20 h	25 h	50 h	100 h	200 h	300 h	500 h	1000 h	
	1.5 R/h	4 min	40 min	80 min	3 h	6 h	13 h	16 h	33 h	66 h	133 h	200 h	333 h	666 h	
	2 R/h	3 min	30 min	60 min	150 min	5 h	10 h	12 h	25 h	50 h	100 h	150 h	250 h	500 h	
	3 R/h	2 min	20 min	40 min	100 min	3 h	6 h	8 h	16 h	33 h	66 h	100 h	166 h	333 h	
	4 R/h	90 sec	15 min	30 min	75 min	150 min	5 h	6 h	12 h	25 h	50 h	75 h	125 h	250 h	
	5 R/h	60 sec	12 min	24 min	60 min	120 min	4 h	5 h	10 h	20 h	40 h	60 h	100 h	200 h	
LIFE- SAVING ONLY DANGER	7.5 R/h	30 sec	8 min	16 min	40 min	80 min	160 min	3 h	6 h	13 h	26 h	40 h	66 h	133 h	
	10 R/h	30 sec	6 min	12 min	30 min	60 min	120 min	150 min	5 h	10 h	20 h	30 h	50 h	100 h	
	20 R/h	15 sec	3 min	6 min	15 min	30 min	60 min	75 min	150 min	5 h	10 h	15 h	25 h	50 h	
	30 R/h	10 sec	2 min	4 min	10 min	20 min	40 min	50 min	100 min	3 h	6 h	10 h	16 h	33 h	
	40 R/h	5 sec	90 sec	3 min	7 min	15 min	30 min	37 min	75 min	150 min	5 h	7 h	12 h	25 h	
	50 R/h	5 sec	60 sec	2 min	6 min	12 min	24 min	30 min	60 min	120 min	4 h	6 h	10 h	20 h	
VOLUNTEERS ONLY GRAVE DANGER	75 R/h	5 sec	45 sec	90 sec	4 min	8 min	16 min	20 min	40 min	80 min	160 min	4 h	6 h	13 h	
	100 R/h	1 sec	30 sec	60 sec	3 min	6 min	12 min	15 min	30 min	60 min	120 min	3 h	5 h	10 h	
	200 R/h	1 sec	15 sec	30 sec	90 sec	3 min	6 min	7 min	15 min	30 min	60 min	90 min	150 min	5 h	
	300 R/h	1 sec	10 sec	20 sec	60 sec	2 min	4 min	5 min	10 min	20 min	40 min	60 min	100 min	3 h	
	400 R/h	1 sec	5 sec	15 sec	45 sec	90 sec	3 min	3 min	7 min	15 min	30 min	45 min	75 min	150 min	
	500 R/h	1 sec	5 sec	10 sec	30 sec	60 sec	2 min	3 min	6 min	12 min	24 min	36 min	60 min	120 min	
	750 R/h	1 sec	5 sec	10 sec	20 sec	45 sec	90 sec	2 min	4 min	8 min	16 min	24 min	40 min	80 min	
	1000 R/h	1 sec	1 sec	5 sec	15 sec	30 sec	60 sec	90 sec	3 min	6 min	12 min	18 min	30 min	60 min	

Table shows time needed at a Dose Rate (row) to cause a specific Dose (column) and only takes into account external gamma radiation, not internal contamination.

Times are rounded down for safety.

Dose Rate colors based on Radiation Dose Rate Guidance table. Dose colors (columns) based on DHS/FEMA and EPA Emergency Worker Dose Guidelines

1 µR = 0.001 mR = 0.00001 R Natural Background: about 10 µR/h = 0.01 mR/h = 0.00001 R/h = about 0.25 mR/day

1 day = 24 hours 100 hours = 4 days 1 week = 7 days = 168 hours

1,000,000 µR = 1,000 mR = 1 R 1,000 hours = 6 weeks 2,000 hours = 12 weeks 1 year = 365 days = 8,760 hours 20,000 hours = 833 days

Potentially Lethal: For whole body doses received in a short time, the LD50 dose (50% deaths in 30 to 180 days) is about 300 rem without treatment or 600 rem with medical treatment.

The LD100 dose (100% deaths) is about 1,000 rem. If the exposure is spread out over a longer period of time (for example, days instead of minutes), the risk of death is lower.

CTOS0003aV1.0910

Counter Terrorism Operations Support www.ctosnsa.org

Appendix G

(Stay Time Table)

Radiation Dose Rate Guidance

DOSE RATE Recommendations	Values
Contaminated Persons ¹	2 x Background Reading (cpm or μ R/h or mR/h)
Limit of Radioactive "Plume" on the Ground or Air ²	5 x Background Reading (cpm or μ R/h or mR/h)
Establish Hot Line ³ CAUTION	1 mR/h to 10 mR/h (0.001 R/h to 0.010 R/h)
Work in Hot Zone CAUTION - DANGER	Hot Line up to 10 R/h (up to 10,000 mR/h)
Turn-Around Dose Rate For NON-Life-Saving ⁴ DANGER	10 R/h
Turn-Around Dose Rate for LIFE-SAVING ⁵ DANGER	100 R/h
Life-Saving, Very Short Duration Only (Informed Volunteers) ⁵ GRAVE DANGER	More than 100 R/h

¹ EPA *Manual of Protective Action Guides and Protective Actions for Nuclear Incidents* EPA 400-R-92-001

² DOE *FRMAC Monitoring and Analysis Manual Radiation Monitoring and Sampling*. DOE/NV/11718-181-VOL.1

³ See guidance from local or state authorities. ASTM (E 2601-08 *Standard Practice for Radiological Emergency Response*), NCRP (Commentary No. 19), and IAEA (EPR-First Responders 2006) recommend 10 mR/h. Many local jurisdictions use 2 mR/h.

⁴ NCRP *Management of Terrorist Events Involving Radioactive Material*, NCRP Report No. 138
DOE FRMAC uses 1.5 R/h for Turn-Around, unless otherwise directed. DOE/NV/11718-181-VOL.1

⁵ Adapted from ASTM (E 2601-08 *Standard Practice for Radiological Emergency Response*), Federal Interagency Committee (*Planning Guidance for Response to a Nuclear Detonation*, 2nd Edition), and DOE Los Alamos National Laboratory (LA-UR-99 *Emergency Medical Rescue in a Radiation Environment*)
See guidance from local or state authorities for maximum dose rate that can be entered for life-saving activities.

DHS/FEMA and EPA Emergency Worker Dose Guidelines

Dose limit (whole body)		Emergency Action Dose Guidelines Activity performed
5,000 mrem	5 rem	All activities.
10,000 mrem	10 rem	Protecting major property.
25,000 mrem	25 rem	Lifesaving or protection of large populations.
More than 25,000 mrem	More than 25 rem	Lifesaving or protection of large populations, Only by volunteers who understand the risks.

Dose includes sum of external dose and dose due to internal contamination. Dose limits for eyes is 3 x the values listed above. Dose limit for any other organ (including skin and extremities) is 10 times the values listed above.
EPA *Manual of Protective Action Guides and Protective Actions for Nuclear Incidents* EPA 400-R-92-001
DHS/FEMA *Planning Guidance for Protection and Recovery Following Radiological Dispersal Device (RDD) and Improvised Nuclear Device (IND) Incidents*

Appendix H

(Sample-Public Decontamination Instructions)

Los Angeles County Multi-Agency Radiological Response Plan

Instructions

Instructions No. 2: Instructions to Public on How to Perform Decontamination at Home

You may have been exposed to low levels of radioactive materials ("dust"). The dust may have gotten on your hair, skin, clothing, and personal property. Depending on your location, the radioactive dust could be on your vehicle, home, yard, lawn furniture, BBQ grill, or anything outside. The dust may have gotten on your jewelry, wallet or purse, or other personal belongings if you were near the incident. You are not in immediate danger from this radioactive dust; however, you need to go home or to another designated area to remove the dust, which is called decontamination. Because radiation cannot be seen, smelled, felt, or tasted, people at the site of an incident will not immediately know if they have been exposed to radioactive materials. Follow these instructions to limit your contamination.

Get out of the immediate area quickly. Go directly home, inside the nearest safe building, or to an area to which you are directed by law enforcement or health officials. *Do not go to a hospital unless you have a medical condition that requires treatment.*

If radioactive dust is on your clothes, removing them as quickly as possible will remove up to 90% of the dust, while helping to prevent you from breathing in or ingesting the dust and will also reduce the length of time that you are exposed to radiation. When removing the clothing be careful of any clothing that has to be pulled over the head. Try to either cut it off or prevent the outer layer from coming in contact with the nose and mouth area. You may also hold your breath while carefully pulling clothing over the head. Removal of clothes should be done in a garage or outside storage area if available, where the ground can be washed off easily. If an outside area is not available, the removal of clothing should take place in a room where the floor can be easily cleaned, such as a tub or shower area. Swiffer® pads are good for decontaminating smooth surfaces including the floor. Clothing should be rolled up with the outside "in" to minimize spreading the dust.

If possible, place the clothing in a plastic bag (double bagging is best to reduce the chances of it breaking), and leave it in an out-of-the-way area, such as the corner of a room or garage. Keep people away from it to reduce their exposure to radiation. You may be asked to bring this bag for follow-up tests or for disposal at a later time.

Keep cuts and abrasions covered when handling anything you think has the radioactive dust on it to avoid getting radioactive material in the wound.


Shower and wash all of the exposed parts of your body and hair using lots of soap and lukewarm water to remove the dust. Simple washing will remove most of the radioactive dust. Do not use abrasive cleaners, or scrub too hard. Do not use hair conditioners in your hair because it could trap the radioactive dust onto your hair.

You can also wash your valuables and other personal property. You can wash off valuables and small items at the same time that you wash yourself. If an outside area is not available or if the items are small, the decontamination should take place in a room where the floor can be easily cleaned, such as a tub or shower area. Swiffer® pads are good for decontaminating smooth surfaces including the floor. Wash the items with lots of water and soap. A scrub brush can be used to reach small spaces. Only decontaminate items that you can easily move to this location as other larger items can be washed off in place.

This page intentionally left blank

Appendix I

(Public Assistance for Ambulance Services)

	FEMA	DISASTER ASSISTANCE
FACT SHEET		9580.104
PUBLIC ASSISTANCE FOR AMBULANCE SERVICES		
Overview		
<p>This fact sheet identifies ambulance services that are eligible for reimbursement under the <i>Category B, Emergency Protective Measures</i> provisions of the Federal Emergency Management Agency's (FEMA) Public Assistance Program. FEMA will reimburse eligible applicants reasonable costs associated with eligible work, such as evacuation and rescue operations, during federally declared major disasters and emergencies. See Sections 403 and 502 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. §§5121-5206 (Stafford Act) and implementing regulations 44 CFR Part 206.</p>		
Public Assistance Eligibility		
<ul style="list-style-type: none">• Eligible applicants:<ul style="list-style-type: none">◦ Eligible applicants may include State, local, and tribal governments and private nonprofit organizations or institutions which provide ambulance services (44 CFR §§206.221, and 206.222). State, local, and tribal governments may provide ambulance services directly, or may contract with other ambulance service providers for such services, including mutual aid agreements and emergency memoranda of understanding.◦ Private for-profit ambulance providers are not eligible for direct reimbursement from FEMA. The State, local or tribal government that contracted with the private ambulance providers may submit a claim for reimbursement to FEMA. Reimbursement will be subject to cost sharing requirements. See 44 CFR §206.203(b).		
Prepared By: Public Assistance Division		Page 1 of 1

http://www.fema.gov/pdf/government/grant/pa/9580_104.pdf

Appendix I

(Public Assistance for Ambulance Services)

DISASTER ASSISTANCE FACT SHEET DAP9580.104

PUBLIC ASSISTANCE FOR AMBULANCE SERVICES

- If required as a result of a emergency or major disaster declaration, eligible ambulance service provider costs include, but are not limited to, the following:
 - The costs of activating ambulance contracts and staging of ambulances (contract or publicly owned) prior to the impact of an incident, such as landfall of a hurricane, typhoon, or tropical storm. Contracts for staging ambulance services must be part of the state or regional evacuation plan. The costs of staging ambulances are eligible even if the incident does not directly impact the staging area, provided the president declares an emergency or major disaster.
 - The reasonable costs incurred in advance of or as the result of an emergency or major disaster declaration for transporting disaster victims to a hospital or other medical facility.
 - The reasonable costs for ambulance services used to transport a congregate shelter evacuee/shelteree to the nearest hospital equipped to adequately treat the medical emergency.
 - Ambulances used for distributing immunizations, staffing shelters and emergency departments, setting up mobile medical units, and responding to hazards.
 - The costs to staff congregate shelters with medical practitioners to provide assistance to evacuees.
 - Costs of ambulances used in support of shelter operations or onsite at shelter locations.
 - Symptom surveillance and reporting, and transporting and redistributing patients to make necessary hospital bed space available.
 - Equipment costs incurred by the ambulance provider, including fuel and medical supplies capable of providing basic and advanced life support. The costs for using applicant-owned equipment while conducting eligible work are reimbursed in accordance with 44 CFR §206.228.
 - Eligible costs will be limited to a period of up to 30 days from the date of the emergency or major disaster declaration, or as determined by the Federal Coordinating Officer.
 - The ambulance transportation service provided should be customary and appropriate for the work required. Emergency air and ground ambulance services may be required to transport disaster victims and/or evacuees requiring emergency medical care to medical facilities. Para-transit transportation services (such as vans, minibuses, and buses) may be required as an alternative transportation mode for individuals including senior citizens, individuals with disabilities, individuals in nursing homes and assisted living facilities, and for homebound individuals impacted by a disaster.

Appendix I

(Public Assistance for Ambulance Services)

DISASTER ASSISTANCE FACT SHEET DAP9580.104

PUBLIC ASSISTANCE FOR AMBULANCE SERVICES

- An eligible applicant may not seek reimbursement from FEMA for any ambulance service costs that are covered by private insurance, Medicare, Medicaid or a pre-existing private payment agreement. States must use due diligence in determining whether a prohibited duplication of benefits has occurred and return those funds to FEMA at a project's final inspection and closeout.
- FEMA reimbursement for activating, staging, and using ambulance services will end when:
 - FEMA and State determine that the incident did not impact the ambulance staging areas; or
 - Evacuation and repatriation of medical and special needs patients is complete; or
 - The immediate threat caused by the incident has been eliminated and the demand for services has returned to normal operation levels.
- Eligible labor costs include, but are not limited to, the following:
 - Overtime pay for regular full-time employees performing eligible work.
 - Regular time and overtime pay for extra hires specifically hired to provide additional support as a result of the emergency or declared disaster (*See FEMA Recovery Policy RP9525.7, Labor Costs – Emergency Work*, for information related to eligible labor costs while performing emergency work).
 - If volunteer Emergency Medical Technicians perform eligible work essential to meeting immediate threats to life and property resulting from a major disaster or emergency, FEMA will credit the donated labor toward the non-Federal share of the grant costs under the Public Assistance Program (*See Disaster Assistance Policy DAP9525.2, Donated Resources*, dated April 9, 2007, for eligible donated resources criteria).

Appendix I

(Public Assistance for Ambulance Services)

DISASTER ASSISTANCE FACT SHEET DAP9580.104

PUBLIC ASSISTANCE FOR AMBULANCE SERVICES

More Information

More information on Public Assistance eligibility can be found in the FEMA Public Assistance Guide (FEMA 322), dated June 2007; the FEMA Disaster Assistance Policy DAP9523.15, *Eligible Costs Related to Evacuations and Sheltering*, dated April 6, 2007; Disaster Assistance Policy DAP9523.6, *Mutual Aid Agreements for Public Assistance and Fire Management Assistance*, dated August 13, 2007; Disaster Assistance Policy DAP9525.2, *Donated Resources*, dated April 9, 2007; and FEMA Recovery Policy RP9525.7, *Labor Costs – Emergency Work*, dated November 16, 2006.



Carlos J. Castillo
Assistant Administrator
Disaster Assistance Directorate

1/2/09
Date

Appendix J

Acronyms and Abbreviations

ALARA	As Low As Reasonably Achievable
CRCPD	Conference of Radiation Control Program Directors
Decon	Decontamination
DHHS	United States Department of Health and Human Services
DHS	United States Department of Homeland Security
DOE	United States Department of Energy
Doff	to remove personal protective equipment
Don	to put on personal protective equipment
DoD	United States Department of Defense
EMS	Emergency Medical Services
EPA	United States Environmental Protection Agency
ERG	Emergency Response Guide
ERP	Emergency Response Plans
FBI	Federal Bureau of Investigation
FEMA	Federal Emergency Management Agency
HazMat	Hazardous Materials
ICS	Incident Command System
IND	Improvised Nuclear Device
JITT	Just In Time Training
LAMARRP	Los Angeles County Multi-Agency Radiological Response Plan
MAC	Medical Alert Center
OA	Operational Area
PPE	Personal Protective Equipment
RDD	Radiological Dispersal Device
RED	Radiological Exposure Device
SNW	Strategic Nuclear Weapon

This page intentionally left blank

Appendix K

(Sample MCI Field Decontamination Guidelines)

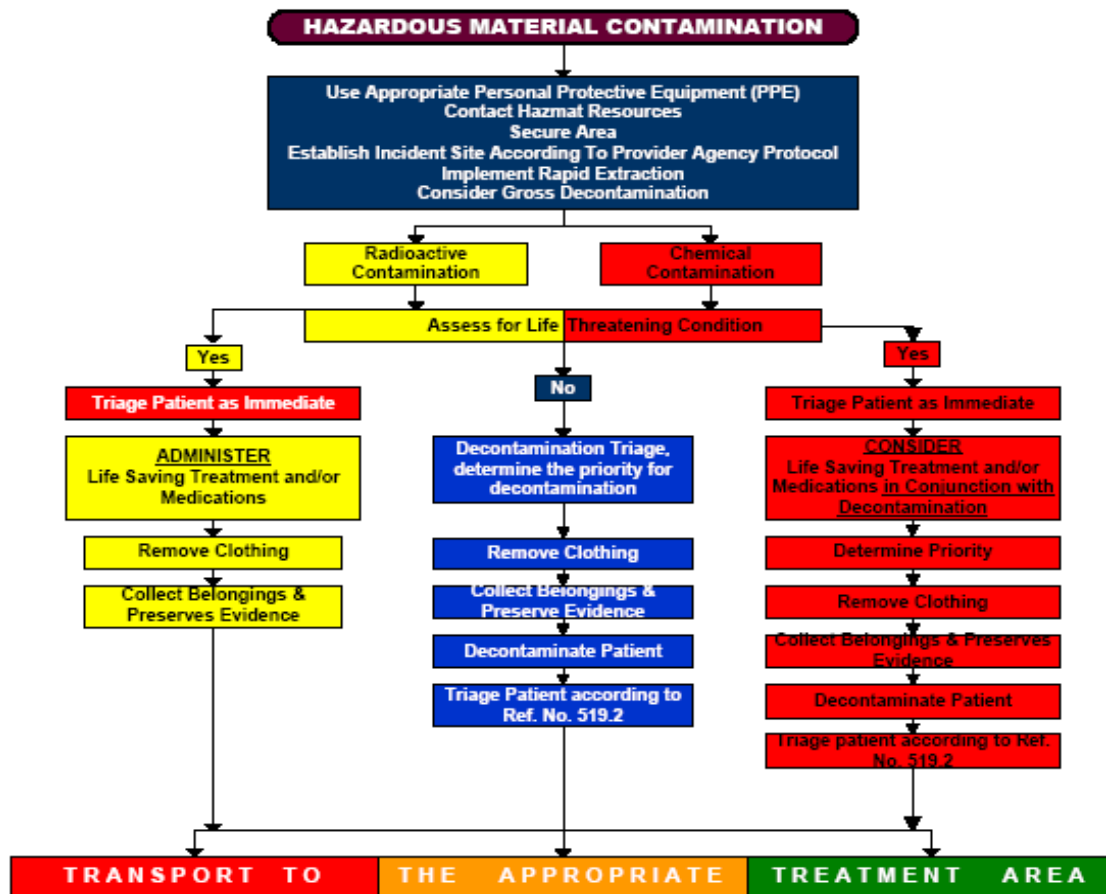
DEPARTMENT OF HEALTH SERVICES
COUNTY OF LOS ANGELES

SUBJECT: MCI FIELD DECONTAMINATION GUIDELINES

(EMT, PARAMEDIC, MICH)
REFERENCE NO. 519.4

PRINCIPLES:

1. The need for decontamination should not delay the provision of time critical medication and treatment (i.e., Mark 1 antidote).
2. Patients shall not be transported to the receiving facility if hazardous chemical contamination is present.
3. Do not delay treatment or transport of patients contaminated with radiation, who also have a life-threatening injury or medical condition. Contamination mitigation efforts and decontamination should be done, only if they do not delay treatment or transport.
4. If incident involves chemical contamination and treatment is required, provider shall contact the base hospital or Medical Alert Center. Treatment should be based on the appropriate treatment protocol.



Effective Date: 1-1-07
Reviewed 07-01-2012

PAGE 1 OF 1

<http://ems.dhs.lacounty.gov/policies/Ref500/519-4.pdf>

This page intentionally left blank

Appendix L

(Responder Equipment Contamination Release Levels)

Los Angeles County Multi-Agency Radiological Response Plan

Tables

Table 11: Responder Equipment Contamination Release Levels

Radiation Type	Existing Contamination Level	Maximum Background Levels	Decontamination Instructions / Release Levels
Level 1 (Third Priority)			
Beta ¹	100 to 10,000 cpm	10 % of Release Level	Decontaminate to lowest level practicable using routine field decontamination methods (wiping and washing) and release without restriction if less than 1,000 cpm beta and 100 cpm alpha.
Gamma ²	(Gamma instruments not usable at these levels)		
Alpha ³	10 to 1,000 cpm		
Level 2 (Second Priority)			
Beta ¹ or	10,000 to 100,000 cpm or	10 % of Release Level	Control large items, bag smaller items, and retain until evaluated by a Radiation Technical Specialist. Items returning to contaminated areas, including ambulances, may be reused during the incident with these contamination levels. ⁵
Gamma ²	50 ⁽⁴⁾ to 100 µR/hr (i.e., 0.01 to 0.1 mR/hr)		
Alpha ³	1,000 to 10,000 cpm		
Level 3 (First Priority)			
Beta ¹ or	Greater than 100,000 cpm (Use gamma above 200,000 cpm) or	10 % of Release Level	Do not reuse or release. Contact a Radiation Technical Specialist for determination of disposition. ⁶
Gamma ²	Greater than 100 µR/hr (i.e., Greater than 0.1 mR/hr)		
Alpha ³	Greater than 10,000 cpm		

Note: Except as noted in the table, either beta or gamma measurements can be used as release criteria. In addition alpha criteria must be met if alpha radionuclides are present.

¹ Measured with a Pancake Geiger-Mueller (PGM) probe at approximately 1-inch from the surface. **Caution:** Do not use PGM above 200,000 cpm. Due to instrument dead-time loss above this value, PGM will significantly under-respond to radiation levels (e.g., a 500,000 cpm reading is actually 1,500,000 cpm).

² Gamma radiation measured with ion chamber, energy compensated Geiger-Mueller detector, or if necessary, sodium iodide or Pancake Geiger-Mueller (PGM). If PGM is used for gamma, face backside of probe towards contamination and if feasible cover front side of probe to shield beta; then read mR/hr or calculate mR/hr using relationship 1 mR/hr = 3,000 cpm (for Cs-137 only). The table mR/hr values are based on a distance of 5-6 inches from the surface to the centerline of the detector. The mR/hr values can be increased by a factor of 5 (e.g., 500 µR/hr = 100,000 cpm) using a 1-inch surface-to-centerline distance. Consult a Radiation Technical Specialist if gamma emitter other than Cs-137 is present or if contamination is in a very small area (e.g., less than the PGM probe area).

³ Measured with an alpha specific detector at approximately ½ inch from a relatively smooth surface. **Caution:** alpha radiation is very difficult to measure accurately. Presence of moisture, oil, dust, or dirt may shield all alpha. Seek Radiation Technical Specialist assistance if alpha contamination is detected.

⁴ Normal gamma background is 5-10 µR/hr; therefore, 50 µR/hr is the lowest practicable gamma level for determining contamination presence while allowing reasonable speed scans. If local background level exceeds 5 µR/hr, the lowest practicable gamma level for determining contamination presence will increase (remember that background needs to be approximately 10% or less than the contamination release level to allow reasonable speed surveying).

⁵ Upon demobilization, high priority equipment, like an ambulance, should be given quicker attention for decontamination efforts to release at the lowest contamination level possible.

⁶ Contamination levels above 10,000 cpm (or even above 100,000 cpm) may be acceptable for release upon consultation with the Radiation Technical Specialist.

cpm counts per minute

mR/hr milliroentgen per hour

µR/hr microroentgen per hour

Reference CRCPD 2006, NCRP 2005, and NCRP 2001 (see Volume II for specific citation)

This page intentionally left blank

References

- ACR Disaster Planning Task Force. *Disaster Preparedness for Radiology Professionals: Response to Radiological Terrorism*. American College of Radiology, 2006. Print. Government Version 3.0.
- Albanese, Joseph. "Initial Local Response and Implications for Public Health, Hospitals and EMS." Lecture. Health Care Conference Administrators, 3 Mar. 2010. Web. 21 Mar. 2012. <http://www.ehcca.com/presentations/emsummit4/albanese_pc2.pdf>.
- Armed Forces Radiobiology Research Institute. *Medical Management of Radiological Casualties Handbook*. 2nd ed. "Radiation Dispersal Device and Industrial Contamination Situations". Bethesda, Maryland: 2003. 51. Print.
- Centers for Disease Control and Prevention. *Radiological Terrorism: Emergency Management Pocket Guide for Clinicians*. Centers for Disease Control and Prevention, 2005. Print.
- Conference of Radiation Control Program Directors, Inc. "*Handbook for Responding to a Radiological Dispersal: First Responder's Guide-The First 12 Hours*," 2006. Print.
- Dodgen, Daniel, Ann E. Norwood, Steven M. Becker, Jon T. Perez, and Cynthia K. Hansen. "Social, Psychological, and Behavioral Responses to a Nuclear Detonation in a US City: Implications for Health Care Planning and Delivery." *Disaster Medicine and Public Health Preparedness* 5.Suppl 1 (2011): S54-64. Print.
- Gusev, I.A., Guskova, A.K., Mettler, F.A. (eds). *Medical Management of Radiation Accidents*. 2nd ed. Boca Raton, FL: CRC Press; 2001. Print
- Hazardous Materials, Chemicals, and Radiation Exposure Decontamination Protocol. Kings County Hospital, University Hospital of Brooklyn and New York City Fire Department. Web. 19 Mar. 2012. <www.downstate.edu>.
- Health Physics Society. *Health Care Facility Template*. Working paper., 2006. Print.
- Homeland Security Council Interagency Policy Coordination Subcommittee for Preparedness & Response to Radiological and Nuclear Threats. *Planning Guidance for Response to a Nuclear Detonation*. 1st ed. 2009. Print.
- Los Angeles County. *Los Angeles County Multi-Agency Radiological Response Plan, Responder Field Manual*. Vol. 1. 2009. Print.
- Los Angeles County Emergency Medical Services Agency and County of Los Angeles Public Health *Terrorism Agent Information and Treatment Guidelines for Clinicians and Hospitals*. "Section III: Nuclear/Radiological Terrorism Information and Treatment Guidelines for Hospitals and Clinicians." 2006. 171-205. Print.

- Los Angeles County Department of Health Services. Emergency Medical Services Agency. *Medical Management of Internally Radiocontaminated Patients*. By Carol Marcus, Jeffry Siegel, and Richard Sparks. 2006. Print.
- Los Angeles County Emergency Medical Services Agency. *Mass Casualty Decontamination for Hospitals*. "Module 4: Patient Decontamination.", 2006. 39. Print.
- Los Angeles County Emergency Medical Services Agency, comp. *Prehospital Care Policy Manual*. 1 July 2012. Reference No: 519.4 MCI Field Decontamination Guidelines. Print.
- Los Angeles County Emergency Medical Services Agency, comp. *Prehospital Care Policy Manual*. 1 July 2012. Reference No: 1235 Radiological Exposure. Print.
- Mettler, F.A., Bhargavan, M., Faulkner, K., et al. Radiologic and Nuclear Medicine Studies in the United States and Worldwide: frequency, radiation dose, and comparison with other radiation sources—1950–2007. *Radiology* 2009;253(2):519–530. Print.
- National Academy of Sciences. *Health Effects of Exposure to low Levels of Ionizing Radiation*. BEIR V. Washington, D.C.: National Academy Press; 1990. Print.
- National Council on Radiation Protection and Measurements. *Management of Terrorists Events Involving Radioactive Material*. Bethesda, Maryland: NCRP Report No. 138, 2001. ISBN 0-929600-71-1, Print.
- National Council on Radiation Protection and Measurements. *Ionizing Radiation Exposure of the Population of the United States*. Bethesda, Maryland: NCRP Report No. 160., 2009: ISBN 978-0-929600-98-7, Print.
- New York State Department of Health. "Radiological Terrorism Rapid Response Card." Dec. 2002. Web. 21 Mar. 2012. <www.health.ny.gov/environmental/emergency/radiological_terrorism/radtterr.htm>
- Radiation Emergency Assistance Center Training Site. *The Medical Aspects of Radiation Incidents*. Oak Ridge, TN: 2011. Print.
- Sierra-Sacramento Valley EMS Agency. *Hazardous Materials Incidents Reference No. 836*. Sierra-Sacramento Valley EMS Agency, 2010. Print.
- Staffan, Klark. "Understanding the Disaster Cost Reimbursement Process." American Ambulance Association. Web. 22 Mar. 2012. <www.the-aaa.org/Members_Only/Industry_issues/homeland_security/emergency_preparedness/Understanding_disaster_cost_reimburse_process.html>.

Tempe Fire Department. *Radiological Response 208.01C Policies and Procedures*. Tempe, Arizona: Tempe Fire Department, 2009. Print.

Yu, C, et al. *Preliminary Report on Operational Guidelines Developed for Use in Emergency Preparedness and Response to a Radiological Dispersal Device Incident*. United States Department of Energy. 2009. Print.

United States Department of the Army. Field Manual 3-5, NBC Decontamination. July 2000. Print

United States Department of Health and Human Services. *Radiation Emergency Medical Management*. Radiological Exposure or Contamination Algorithms. Digital image. Web. 22 Mar. 2012. <www.remm.nlm.gov/>.

United States of America. Department of Homeland Security. Federal Emergency Management Agency. *Public Assistance for Ambulance Services Fact Sheet 9580.104*. Print.

This page intentionally left blank

Web Resources

American Association of Physicists in Medicine

www.aapm.org

American College of Radiology

www.acr.org

California Department of Health Services

www.bepreparedcalifornia.ca.gov/beinformed/radiationemergencies/Pages/Radiation+Emergencies.aspx

Centers for Disease Control and Prevention (CDC)

emergency.cdc.gov/radiation

Conference of Radiation Control Program Directors, Inc. (CRCPD)

www.crcpd.org/RDD_Handbook/RDD-Handbook-ForWeb.pdf

www.crcpd.org/stateservices/commercialservices/radwastebrokerservices.pdf

Department of Health and Human Services (DHHS)-Radiation Emergency Medical Management

www.remm.nlm.gov

Department of Homeland Security (DHS)

www.dhs.gov/radiological-attack-fact-sheet

Federal Emergency Management Agency (FEMA)-Ready

www.ready.gov/document/be-informed-radiation-threat

Health Physics Society

hps.org

Armed Forces Radiobiology Research Institute

Medical Management of Radiological Casualties Handbook-Online Edition

www.usuhs.mil/afrrri/outreach/pdf/3edmmrchandbook.pdf

National Alliance for Radiation Readiness

www.radiationready.org

National Council on Radiation Protection & Measurements

www.ncrponline.org

Oakridge Research Institute for Science and Education (ORISE)

orise.ornl.gov

Radiation Emergency Assistance Center/Training Site (REAC/TS)

www.ornl.gov/reacts

This page intentionally left blank