DECONTAMINATION
CHAPTER 7
TERMINAL OBJECTIVES

- Describe differences between exposure and contamination.
- Define contamination types, including sources and hazards, the potential routes of exposure, and types of decontamination (emergency, mass, technical).
- Describe the purpose, advantages, and limitations of emergency decontamination and the procedures, tools, and equipment for performing emergency decontamination.
ENABLING OBJECTIVES

• Define the purpose of decontamination for people, property, and environment that responders must consider when responding to a hazardous materials incident.

• Define and describe the two categories of decontamination methods (physical and chemical).

• Define and describe three specific types of decontamination methods (emergency, mass, and technical) and the advantages, limitations, and requirements for each type.
ENABLING OBJECTIVES

• Describe the layout and incident-specific considerations for locating the decontamination corridor within site control zones.

• Describe other decontamination considerations such as responder safety, environmental concerns, special population needs, and equipment decontamination.
INTRODUCTION

NFPA definitions to know:

Decontamination:
- Physical or chemical process to reduce and prevent the spread of contamination

Contamination:
- Transferring hazmat from one source to another

Cross Contamination:
- Contaminants carried out of the hot zone
PURPOSE OF DECONTAMINATION

Physical and/or chemical process of reducing and preventing the spread of contamination

Three reasons for decontaminating casualties:

• To remove the agent from the casualty’s skin and clothing
• To protect emergency responders and medical personnel from cross-contamination
• To prevent the spread of contamination
All methods of decontamination start with “Gross Decon”

NFPA definition of gross decon:

• First step where a significant reduction of contamination occurs
• Physical removal of contaminants or flooding quantity of water
PHYSICAL DECONTAMINATION

• Dilution
• Removal, isolating, and disposal

Can also include:
• Absorbing/adsorbing
• Vacuuming
• Dry scraping/scrubbing
• Evaporation
• Solidifying
• Pressurized air
CHEMICAL DECONTAMINATION

Chemical degradation of contaminants by:

- Bleach
- Strong detergents
- Solidification

For biological hazards:

- Disinfection:
  - Reduce biologically active contaminants
- Sterilization:
  - Destroy all biologically active contaminants
TYPES OF DECONTAMINATION

• Emergency
• Mass
• Technical
EMERGENCY DECONTAMINATION

- Used when responders encounter a life-threatening situation
- Not always a controlled situation
- As fast and as thorough possible
  - Remove victim from contaminated area
  - Wash immediately any exposed body parts
  - Remove victims clothing
  - Wash from head to toe
  - Provide BLS
  - Transfer to EMS
MASS DECONTAMINATION

• Used for a large number of victims in life-threatening situations
• Considerations for injured people, children, and special needs
• High volume: Low-pressure water spray
• Runoff is allowed
AMBULATORY CASUALTIES

• Victims can walk and follow commands (minor injuries)
  • Direct victims to remove clothing and proceed to ambulatory decon lanes
• Clothing should be bagged and labeled
• Victim should shower with large quantities of water
• Monitor victims looking for additional contamination
• Direct victims to redress and shelter
NONAMBULATORY CASUALTIES

- Decon requires more time and is labor intensive
  - Cut clothing and remove
  - Treat immediate medical concerns
  - Wash with soap and water
  - Decon any medical equipment used to treat casualties
  - Verify thoroughness of decon
  - Transfer to EMS
TECHNICAL DECONTAMINATION

• Systematic process of reducing contamination to a level that is “ALARA”
• Station based process for response personnel and equipment
• Decon corridor established in Warm Zone

Stations include:
  • Tool drop station
  • Gross station
  • Wash station(s)
  • PPE removal station
  • Body wash station
  • Medical evaluation
SIMPLE TECHNICAL DECON

Dirty End

- Equipment drop
- Glove & boot drop

Clean End

- Hand & face wash
- Remove suit
- Medical monitoring

Dirty End:
- Gross
- Wash 1
- Wash 2

Dirty End:
- Equipment drop
- Glove & boot drop

Clean End:
- Hand & face wash
- Remove suit
- Medical monitoring
DECON CORRIDORS

• Located in the Warm Zone with “dirty” end touching the Hot Zone and “clean” end touching the Cold Zone

Layout of corridor should consider:
• Agents to be decontaminated
• Resources
• Terrain
• Wind direction
• Runoff management
LAYOUT OF CORRIDOR
CONSIDERATIONS: RESPONDER SAFETY

• PPE in warm zone is one level below or equal to hot zone
• Use caution when touching anything in decontamination area
• Use assistant to remove protective clothing
• Do not allow casualties to touch responders
• Protect physical safety at decontamination zones
• Contain contaminated materials
• Decontamination team must wear appropriate PPE, remain at assigned station, and go through decontamination last
CONSIDERATIONS: ENVIRONMENTAL

• Ensure decontamination effectiveness to prevent cross-contamination
• Contain runoff so it does not further contaminate the environment
• Make all reasonable efforts to contain contamination and to avoid or mitigate environmental consequences
SPECIAL CONSIDERATIONS

• Access and functional needs
• Cultural differences and language barriers
• Blind, deaf, illiterate, and cognitive impairment
• Communicate decontamination requirements using illustrated posters/flyers written in the languages spoken in community
• Modesty concerns
SPECIAL CONSIDERATIONS

Animal decon:
- Working animals
- Service animals
- Domestic animals (pets)

Equipment decon:
- Last items to be decontaminated
- Follow manufacturer recommendations
- Some tools may absorb chemicals and require disposal
WEATHER

• Temperatures 36°F and above
  • Decon outside and move immediately inside
• Temperatures 35°F and below
  • Perform decon inside
• If victims are wet, there is higher probability of cold shock and hypothermia
• Decon personnel should be monitored for heat-related illness due to PPE use
SUMMARY

- Purpose of decontamination
- 3 types of decontamination
- Decontamination corridor considerations
- Special considerations