Search and Rescue Operations
Unit Objectives

- Identify sizeup requirements
- Describe most common search techniques
- Use safe techniques for debris removal
- Use safe techniques for victim extrication
- Describe ways to protect rescuers
Search and Rescue

- In a disaster, CERT teams assist with light search & rescue
  - A team may be assigned to search a particular building or area

- **LIGHT** search & rescue = cert
  - Heavy rescue (collapsed building) done by USAR professionals
People trapped after a disaster can survive hours or even days. The more quickly they are rescued, the better their chance of survival.
Deciding to Attempt Rescue

- Decision based on three factors
  - The risks involved for the rescuer
  - Greatest good for the greatest number
  - Resources and manpower available
Goals Of Search And Rescue

• Rescue greatest number in shortest amount of time

• Rescue walking wounded and lightly trapped victims first

• Always protect rescuer safety
Effective Search & Rescue

- Depends on:
  - Effective Size Up
  - Rescuer Safety
  - Survivor Safety
Search and Rescue Operations

1. Search
   - Assess damage/size-up situation
   - Locate victims.
   - Document location.

2. Rescue
   - Extricate victims
   - Triage/stabilize
   - Move victims
   - Mark location as searched
1. Gather Facts
2. Assess Damage
3. Consider Probabilities
4. Assess Your Situation
5. Establish Priorities
6. Make Decisions
7. Develop Plan of Action
8. Take Action
9. Evaluate Progress

REMEMBER:
CERT SIZEUP IS A CONTINUOUS PROCESS
Step 1: Gather facts

- Time of event and day of the week
- Construction type/terrain
- Occupancy
- Weather
- Hazards
Step 2: Assess Damage

Assess & Communicate Damage

Three levels of damage

- Light damage
- Moderate damage
- Major damage
When to Search & Rescue:

LIGHT DAMAGE
YES

MODERATE DAMAGE
Cautiously

HEAVY DAMAGE
NO
LIGHT DAMAGE

- Superficial damage
- Broken windows
- Fallen or cracked plaster
- Minor damage to interior contents
- A few small hairline cracks
- Safe to enter and remain
• Substantial damage in many areas
• Multiple visible cracks in walls
• Substantial damage to interior such as
  ➢ many toppled furnishings,
  ➢ fallen ceilings
The CERT mission is to locate; treat airway, major bleeding, and shock; evacuate; warn others; continue sizeup while minimizing the number of rescuers and time spent inside the structure.
MAJOR DAMAGE

- Major cracks more than 1/8” in loadbearing walls
- Major damage to loadbearing columns or beams
- Large X-shaped cracks in the building exterior
- Building leaning
- Partial or total collapse
MAJOR DAMAGE

- Secure the building perimeter
- Vocal triage
- **DO NOT** enter the building
- Wait for heavy rescue teams
Single-Family Dwellings

- **Wood Frame**: light damage to masonry/chimneys
- **Pre-1940**: House may slide off foundation
- **Hillside**: ground failure and considerable damage
- Bricks on edge every 5-7 rows
- Expect Heavy Damage unless well reinforced
- Walls collapse first, then the roof
Tilt-Up Structures

- Expect Heavy Damage
- Lightweight roof construction makes them subject to collapse
Steel Frame High-Rise Buildings

Usually Light or Moderate Damage

- Structures are reinforced
- Main damage will be
  - broken glass
  - content movement
  - exterior trim/facades

Businesses in and around Seattle were damaged by the February earthquake in Washington State.

FEMA News Photo
Search Operations

- Make **rescuer safety** your primary concern.
- Use a buddy system.
- Be alert for hazards.
- Use safety equipment.
- Rotate teams.
- Rehab rescuers
Locating Victims

- Identify VOIDS where victims may be
- Interview survivors
- Estimate victim locations
- Consider cell phone photos
Conducting Search Operations
Pancake Voids
Conducting Search Operations
Lean-To Voids
“V” Voids
“V” Voids
Individual Voids
Search Systematically

1. Call out to victims
2. Use systematic search pattern
3. Stop frequently to listen
4. Triangulate
5. Mark searched areas/document
6. Report results
Call Out to Victims

“Anyone that can hear me, come to the sound of my voice!”
Use Systematic Search Pattern

- Bottom Up/Top Down (multi-story buildings)
- Right Wall/Left Wall
Listen Carefully

- Stop periodically to listen for taps, movement or voices
4 Triangulate

- Use flashlights to point towards victim sounds,
- Use the buddy system
Upon entering search area:
- Make a slash
- Write Team ID, time, & date

Upon leaving search area:
- Complete ‘X’
- Write victim numbers & time out
Example:

- 2/15/08
- In: 1430
- Out: 1515
- 2L
- Moved to CERT-23 med ops
- FL 1-2 searched
- Stairs to FL-3 unsafe
- Moved to CERT-23 med ops
Interior Markings: Start where you exit the stairs
   - Make a slash at the enter and a slash when you exit
Search Markings

- Search Markings are often confused for building markings/structure markings
- Lets others know you entered and exited safely
- Documents the findings
Search Markings – Floor marking
Victim Location

- Suspected victim location
- Confirmed live victim
- Confirmed dead victim
- Victim removed
Boxing the “X” in means don’t re-enter.

Gold Team

TIME IN: 1430 hrs
TIME OUT: 1520 hrs

GAS OFF

MISC
Structural Marks

Good - structurally sound

Has Problems - may become structurally unsound rapidly

Bad - structurally unsound

These marks should be big! 2ft. Sq. minimum
- Cosmetic Damage
- Debris without Structural damage
- Utilities probably not an issue
Ok, BUT...

- Has evidence of early structural damage
- Examples are cracks around door frames, window frames, building/foundation area
- Risk versus benefit – enter, complete your work and exit
- Some areas may need bracing/shoring
- May fail after an aftershock
- Has structural failure and is subject to collapse
- Structural engineer needs to identify safe haven
- Shoring will be required
Additional Building Information

- When was the building checked?
- Who checked it?
- What was found?
- Arrows to entrance/safe haven

5/5/02
1415 hrs
HM - no
CATF-4
3 Different Markings

- Search Markings
- Building Markings
- Victim Finds
Keep complete records both of removed victims and of victims who remain trapped or dead.

If you don’t document it, it didn’t get done!
Rescue Operations

Primary Functions:

- Creating a safe rescue environment
  - Lift objects out of the way
  - Use tools to remove objects
  - Remove debris
- Triaging or stabilizing victims
- Removing survivors
Creating A Safe Environment

- Maintain rescuer safety
  - Triage in lightly damaged buildings
  - Stabilize and evacuate victims quickly from moderately damaged buildings

Note: Never attempt a rescue from a stuck elevator
Victim Extrication Method

Depends upon ...

- General stability of immediate environment
- Number of rescuers available
- Strength and ability of rescuers
- Condition of victim
Leveraging/Cribbing

- “Lifting” using a lever to lift an object.
- “Cribbing” using boards, blocks etc. to stabilize something we have lifted.
- “Box Cribbing” arranging boards in a box configuration to stabilize heavy objects.
Lifting/Cribbing
Lifting/Cribbing
Moving Survivors

- Avoid strength moves
- Think rescuer and victim safety
- Visualize and verbalize for the patient
- Use proper lifting procedures:
  - Back straight
  - Bend Knees
  - Keep load close to your body
  - Push up with your legs
Patient Carries

Assist a lightly injured person to walk

REMEMBER: Let the walking wounded walk!
Patient Carries

Use a blanket to drag a victim
Use the Chair Carry to move patients through tight areas.
Two Person Carry

This helps the rescuers maintain good control over the patient.
Using the Evacu-Trac Chair

The Evacu-Trac brake is normally on. To descend the stairs, release the brake by slowly squeezing the brake lever. Descent speed can be slowed by reducing pressure on this lever. A governor limits the maximum descent speed to about 3' per second, allowing even a small attendant to safely transport heavier riders.
Using the Evacu-Trac Chair

On stairs, the tracks securely grip the stair noses and control the descent speed regardless of the stair covering. On flat surfaces, Evacu-Trac can be pushed on its wheels as easily as a stroller. This feature allows the user to be transported to an area clear of the emergency rather than to an area of refuge.
Questions???