CHAPTER 15
URBAN SEARCH AND RESCUE
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INTRODUCTION

Every Urban Search & Rescue (USAR) incident is different. It is not possible to develop a document outlining a single chronology or sequence of actions. The order of operations depicted in this document may have to be altered to meet the situation. In some cases, various issues may have to be addressed simultaneously.

The Urban Search & Rescue (USAR) organizational module of the FOG is designed to provide an overview of the essential USAR functions at incidents where technical rescue expertise and equipment are required for safe and effective rescue operations. These incidents can be caused by a variety of natural events (i.e., earthquakes, floods, tornados, or hurricanes) that cause widespread damage to a variety of structures, mass transportation accidents with multiple victims, or single site events such as excavation collapse or confined space rescue operations involving only a few victims. USAR operations are unique in that specialized training and equipment are required to mitigate the incident in the safest and most efficient manner possible.
USAR INCIDENT COMMAND SYSTEM INTEGRATION

a) It is a planning assumption that an ICS system will be in place before the arrival of USAR elements,

b) The first arriving USAR command officer will coordinate the command of USAR resources with the Incident commander. The following actions will be reviewed:
   • Size up of incident and command structure
   • Isolation and security of the scene (deny entry, establish control zones)
   • Staging of incoming units
   • Gather information regarding the involved structure/s type, possible number of people trapped etc.
   • Add ICS positions as needed
   • Assure proper notifications of law enforcement, hospitals local, state and federal agencies have occurred
   • Request additional resources as needed (i.e., Public Works, Heavy Lifting, etc.)
   • As the incident progresses, participate in the Unified Command
UNIFIED COMMAND

- LIAISON OFFICER
- INFORMATION OFFICER
- SAFETY OFFICER

- OPERATIONS SECTION
  - STAGING AREA(S)
    - USAR BRANCH
      - US&R Operations
    - LAW ENFORCEMENT
    - MASS CASUALTY
    - PUBLIC WORKS BRANCH

- LOGISTICS SECTION

- FINANCE/ADMIN SECTION

- PLANNING SECTION
  - USAR TECHNICAL
### Florida Urban Search & Rescue Resources Types

<table>
<thead>
<tr>
<th>Resource</th>
<th>USAR Teams</th>
<th>Technical Rescue Teams</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Florida Type</strong></td>
<td><strong>Type I</strong></td>
<td><strong>Type II</strong></td>
</tr>
<tr>
<td><strong>NIMS Equivalent</strong></td>
<td>Type I US&amp;R Task Force</td>
<td>Type II US&amp;R Task Force</td>
</tr>
<tr>
<td><strong>Florida Designation</strong></td>
<td><strong>FULL TASK FORCE</strong></td>
<td><strong>INTERMEDIATE TASK FORCE</strong></td>
</tr>
<tr>
<td><strong>Incident Type</strong></td>
<td>Structural collapse, collapse situations including light frame, heavy wall, heavy floor and pre-cast concrete construction</td>
<td>Structural collapse, collapse situations including light frame, heavy wall, heavy floor and pre-cast concrete construction</td>
</tr>
<tr>
<td><strong>Minimum Staffing</strong></td>
<td>70</td>
<td>32</td>
</tr>
<tr>
<td><strong>Max Time to Wheels Turning</strong></td>
<td>&lt; 6 hrs</td>
<td>&lt; 6 hrs</td>
</tr>
<tr>
<td><strong>Operational Period</strong></td>
<td>24-hour operations; Self-sufficient for first 72 hours</td>
<td>12-24 hour operations; Self-sufficient for first 72 hours</td>
</tr>
<tr>
<td><strong>Response Type</strong></td>
<td>State or Federal</td>
<td>Regional, State, Federal</td>
</tr>
</tbody>
</table>
SYSTEM ORGANIZATION

The State of Florida USAR response system is based upon providing a coordinated response to disasters in urbanized environments. Special emphasis is placed on the capability to locate and extricate victims trapped in collapsed buildings, from light residential construction to heavy reinforced concrete structures.

The participating agencies maintain the capability of rapidly deploying resources based on the reported magnitude of the incident. The system is based on a tiered response that will assure the proper response of the closest appropriate resources for the incident.
Type I Full USAR Task Force

This is a State of Florida or Federal asset capable of twenty-four operations for a minimum of seventy-two hours without the need for outside resources and will consist of 68-70 personnel. The staffing for each twelve-hour shift of personnel is a minimum of 31 personnel.
TYPE II INTERMEDIATE TASK FORCE
This is a State of Florida or Federal asset made up of local responders with the personnel, equipment and training equivalent to half of a FEMA Task Force. This unit is capable of twelve hour operations for a minimum of seventy-two hours without the need for outside resources. This resource will provide a scaled down version of a full Task Force and will be able to handle some collapse incidents without the need for additional assistance.

Type II consists of a minimum of 32 personnel capable of working for twelve hours. Intermediate teams will typically require relief by a full task force or another intermediate team for twenty-four hour operations.

<table>
<thead>
<tr>
<th>Florida Type II Teams</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task Force 4 Central Florida</td>
</tr>
<tr>
<td>Task Force 5 North Florida</td>
</tr>
<tr>
<td>Task Force 6 South West Florida</td>
</tr>
</tbody>
</table>
TYPE III HEAVY USAR TEAM

A Type III Heavy USAR Team will consist of a minimum of 22 personnel capable of working for up to twelve hours. A Type III response requires relief by an intermediate or full task force for prolonged or twenty-four hour operations.

Florida Type III Teams

<table>
<thead>
<tr>
<th>Task Force 7 Tallassee</th>
<th>State Deployable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task Force 8 North Central Florida</td>
<td>State Deployable</td>
</tr>
<tr>
<td>Task Force 9 Volusia</td>
<td>State Deployable</td>
</tr>
</tbody>
</table>
TYPE IV LIGHT USAR TEAM

This is a State of Florida asset made up of local responders with the personnel, equipment and training for a basic USAR role. This unit is capable of assisting other resources or initial response to USAR incidents.

<table>
<thead>
<tr>
<th>Florida Type IV Teams</th>
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</thead>
<tbody>
<tr>
<td>101- Panama City Fire Dept.</td>
</tr>
<tr>
<td>102- Okaloosa Special Operations</td>
</tr>
<tr>
<td>103- Jackson County Fire Dept.</td>
</tr>
<tr>
<td>104- Escambia County Fire Dept.</td>
</tr>
<tr>
<td>105- South Walton Fire District</td>
</tr>
<tr>
<td>206- Dixie County Fire Dept.</td>
</tr>
<tr>
<td>207- Quincy Fire Dept.</td>
</tr>
<tr>
<td>208- Jefferson County EMS</td>
</tr>
<tr>
<td>309- Alachua County Fire</td>
</tr>
<tr>
<td>310- Gainesville Fire Dept.</td>
</tr>
<tr>
<td>311- Clay County Fire Dept.</td>
</tr>
<tr>
<td>313- Ocala Fire Dept.</td>
</tr>
<tr>
<td>315- Palatka Fire Dept</td>
</tr>
<tr>
<td>316- St. Johns County/St. Augustine Fire Dept.</td>
</tr>
<tr>
<td>417- Citrus County Fire Dept.</td>
</tr>
<tr>
<td>418- Springhill Fire Rescue</td>
</tr>
<tr>
<td>419- Bradenton Fire Rescue</td>
</tr>
<tr>
<td>420- New Port Richey Fire Rescue</td>
</tr>
<tr>
<td>421- Bartow Fire Dept</td>
</tr>
<tr>
<td>422- Polk County Fire Rescue</td>
</tr>
<tr>
<td>423- Hardee County Fire Rescue</td>
</tr>
<tr>
<td>524- Palm Bay Fire Dept.</td>
</tr>
<tr>
<td>526- Lake County Fire Services</td>
</tr>
<tr>
<td>528- Osceola County Fire Rescue</td>
</tr>
<tr>
<td>529- Winter Park Fire Rescue</td>
</tr>
<tr>
<td>530- Sanford Fire Dept</td>
</tr>
<tr>
<td>531- Dayton-Ormond Beach Fire</td>
</tr>
<tr>
<td>532- Deltona Fire Rescue</td>
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</tbody>
</table>
Search Strategy

Two general considerations are used to deploy search resources:

1. **Area to be Searched** – This involves the division of the designated area into manageable sections. Depending upon the size of the damaged area and the search resources available, an area may be sectored by city block, or other easily definable criteria (i.e., Section, Township, and Range). The available search resources will be divided and apportioned to each sector for search operations.

2. **Priorities** – The search area is evaluated for priorities in terms of the type of occupancies affected, amount of damage, pre-evacuation, etc. Areas with the highest likelihood of survivability (in terms of type of construction) and the number of potential victims (in terms of the type of occupancy of the building) will receive attention first. Occupancies such as schools, hospitals, nursing homes, high rise and multi-residential buildings, office buildings, etc., would be high priorities.

Operations Site Set-up

- Once an area is identified with an active rescue, control of the area immediately surrounding the site will be established before rescue operations commence.

- An **Operational Work Area** is established to control access to the rescue work site except for assigned Task Force (TF) members and other local rescue personnel involved in an operation, and to provide safe and secure work areas for the personnel supporting the rescue operations.

- A **Collapse/Hazard Zone** is established to control access to the immediate area that could be affected or impacted by further building collapse, falling debris, or other hazardous situations (i.e., aftershocks). The only individuals that will be allowed within this area are the primary TF personnel directly involved in the search for or extrication of victims. All other TF personnel must be located outside the hot zone until assigned or rotated.

- When establishing the perimeter of the operational work area, the needs of the following areas will be properly identified:
- **Access/Entry Routes (Personnel Accountability Location)** – a clearly defined avenue(s) should be planned and identified for access to and from the rescue work site. Personnel, tools, equipment, and other logistics needs would be safely channeled through this route. In addition, controlled egress will be required to quickly evacuate a victim or injured TF member.

- **Emergency Assembly Area** – location(s) where TF personnel assemble following an emergency evacuation.
Structure/Hazards Markings
A standardized marking system is used to assure rescuer safety and to avoid needles duplication of search efforts. In order to be easily seen, the search mark must be large and of a contrasting color to the background surface. Orange spray paint is the most easily seen color on most backgrounds. Line marking or downward spray cans apply the best paint marks. A lumber marking device may be used to write additional information inside the search mark itself when it would be difficult to write the additional information with spray paint.

A "Main Entrance" search marking will be completed in two steps:

- First, a large (approximately 2’) single slash shall be made near the main entrance at the start of the search with the search team identifier, date and time that they entered marked to the left of the mid point of the slash.

- After the search of the entire structure has been completed a second large slash shall be drawn in the opposite direction forming an “X”. Additional information will be placed in the remaining three quadrants of the Main Entrance “X” summarizing the entire search of the structure.

- The left quadrant will already contain the search team identifier, date and time when the team first entered the structure.

- The top quadrant is for the date and time the search team left the structure.

- The right quadrant is for any significant hazards located inside the structure.

- The bottom quadrant is for the number of “LIVE” or “DEAD” victims still inside the structure this will be indicated with “L” or “D”.

- Use a small “x” in the bottom quadrant if no victims are inside the structure.
• During the search function while inside the structure a large single slash shall be made upon entry of each room or area.

• After the search of the room or area has been completed a second large slash shall be drawn in the opposite direction forming an “X”.

• The only additional information placed in any of the “X” quadrants while inside the structure shall be that pertaining to any significant hazards or the number of “LIVE” or “DEAD” victims.

• If multiple floors are searched a box under the X will show how many floors/quadrants have been searched in the positive. Indicate “F” for floors and “O” for quadrants.
Main Entrance Search Marking

WHEN YOU EXIT — COMPLETED SEARCH

2-24-03
1520 hrs.

SMA
T-1
1150 hrs.

2-L
3-D

Date & Time
Search Team
Left the Structure

Hazard

Total Victims
Still Inside
the Structure

Floors
Search

Floors = F
Quadrants = Q

Interior Search Markings — EACH ROOM OR AREA

WHEN YOU ENTER

WHEN YOU EXIT

Identify Any Victims

Identify Any Hazards
US&R VICTIM MARKING SYSTEM

Make a large (2' x 2') "V" with orange spray paint near the location of a potential victim. Mark the name of the search team or crew identifier in the top part of the "V" with paint or a lumber marker type device.

Paint a circle around the "V" when a potential victim is confirmed to be alive either visually, vocally, or hearing specific sounds that would indicate a high probability of a live victim. If more than one confirmed live victim, mark the total number of victims under the "V".

Paint a horizontal line through the middle of the "V" when a confirmed victim is determined to be deceased. If more than one confirmed deceased victim, mark the total number of victims under the "V". Use both the live and deceased victim marking symbols when a combination of live and deceased victims are determined to be in the same location.

Paint an "X" through the confirmed victim symbol after the all victim(s) have been removed from the specific location identified by the marking.

An arrow may need to be painted next to the "V" pointing towards the victim when the victim's location is not immediately near where the "V" is painted. Show distance on arrow.
**Activation** – Formal request from State of Florida to a Task Force via the Point of Contact, that an event has occurred or is projected to occur, that requires mobilization and response for a mission.

**Advisory** – Formal notification by to TFs that an event is imminent or has occurred but does not require action at this time.

**Alert** – Formal notification by the State of Florida to identified TFs that an incident is imminent or has occurred that may result in an activation.

**Assembly Point (AP)** – Location or facility where TF members initially report after receiving activation orders from the sponsoring organization.

**Cache** – A State of Florida approved complement of tools, equipment, and supplies stored in a designated location, available for emergency use.

**Collapse hazard zone** – The area established by the TF for the purpose of controlling all access to the immediate area of the collapse.

**Emergency signaling** – Signals produced by warning devices on the USAR work site to address evacuation of the area, cease operations or quiet the area, and resume operations.

**Engagement/disengagement** – Procedures followed by a TF when beginning or ending operations at a specific work site or assigned area.

**Heavy Wall Construction** - Materials used for construction are generally heavy and utilize an interdependent structural or monolithic system. These types of materials and their assemblages tend to make the structural system inherently rigid. This construction type is usually built without a skeletal structural frame. It utilizes a heavy wall support and assembly system to provide support for the floors and roof assemblies. Occupancies utilizing
Tilt-up concrete construction are typically one to three stories in height and consist of multiple monolithic concrete wall panel assemblies. They also use an interdependent girder, column and beam system for providing lateral wall support of floor and roof assemblies. Occupancies typically include commercial, mercantile and industrial. Other examples of this type of construction type include reinforced and unreinforced masonry (URM) buildings typically of low rise construction, one to six stories in height, of any type of occupancy.

**Heavy Floor Construction** - Structures of this type are built utilizing case-in-place concrete construction consisting of flat slab panel, waffle or two way concrete slap assemblies. Pre-tensioned or post-tensioned reinforcing steel rebar or cable systems are common components for structural integrity. The vertical structural supports include integrated concrete columns, concrete enclosed or steel frame, which carry the load of all floor and roof assemblies. This type includes heavy timber construction that may use steel rods for reinforcing. Examples of this type of construction include offices, schools, apartments, hospitals, parking structures and multi-purpose facilities. Common heights vary from single story to high-rise structures.

**Joint Management Team (JMT)** – The JMT provides a group of specialists readily available for rapid assembly and deployment to a disaster area. The JMT furnishes Federal, State, and local officials with technical assistance in acquiring and using USAR resources. It provides advice, Incident Command assistance, management, and coordination of USAR Task Forces, and USAR logistics support.

**Light Frame Construction** - Materials used for construction are generally light weight and provide a high degree of structural flexibility to applied forces such as earthquakes, hurricanes, tornadoes, etc. These structures are typically constructed with a skeletal structural frame system of wood or light gage steel components, which provide support to the floor or roof assemblies. Examples of this construction type are wood frame structures used for residential, multiple low rise occupancies and light commercial occupancies up to four stories in height. Light gage steel frame buildings include commercial business and light manufacturing occupancies and facilities.

**Pre-cast Construction** - Structures of this type are built utilizing modular
pre-case concrete components that include floors, walls, columns and other sub-components that are field connected upon placement on site. Individual concrete components utilize imbedded steel reinforcing rods and welded wire mesh for structural integrity and may have either steel beam, or column or concrete framing systems utilized for the overall structural assembly and building enclosure. These structures rely on single or multi-point connections for floor and wall enclosure assembly and are a safety and operational concern during collapse operations. Examples of this type of construction include commercial, mercantile, office and multi-use or multi-function structures including parking structures and large occupancy facilities.
CRANE SIGNALS

ALWAYS STAND IN CLEAR VIEW OF YOUR CRANE HOIST ENGINEER

BE SURE TO STAY A SAFE DISTANCE FROM HOOK, BLOCK OR BOOM

Published by SPECIALIZED CARRIERS & RIGGING ASSOCIATION

In accordance with the American National Standards Institute

USE MAIN HOIST: Tap fist on head, then use regular signals.

USE WHIP LINE: (Auxiliary Hoist) Tap elbow with one hand, then use regular signals.

RAISE BOOM: Arm extended, fingers closed, thumb pointing upward.

LOWER BOOM: Arm extended, fingers closed, thumb pointing downward.

MOVE SLOWLY: Use one hand to give any motion signal and place other hand horizontally in front of hand giving the motion signal. (Point slowly shown as example)

RAISE THE BOOM AND LOWER THE LOAD: With arm extended, thumb pointing up, the fingers in and out as long as load movement is desired.

LOWER THE BOOM AND RAISE THE LOAD: With arm extended, thumb pointing down, the fingers in and out as long as load movement is desired.

SWING: Arm extended, palm with fingers in direction of swing of boom.

STOP: Arm extended, palm down, move arm back and forth horizontally.

EMERGENCY STOP: Both arms extended, palms down, move arms back and forth horizontally.

TRAVEL: Arm extended (fingertip), hand open and slightly raised, making pushing motion in direction of travel.

DOG EVERYTHING: Clasp hands in front of body.

TELESCOPING BOOM TWO HANDS

TELESCOPING BOOM TWO HANDS

TELESCOPING BOOM ONE HAND

TELESCOPING BOOM ONE HAND

EXTEND ARM: One hand signal, one fist in front of chest with thumb tapping chest.

RETRACT ARM: One hand signal, one fist in front of chest with thumb tapping chest.