OES CALIFORNIA
Governor's Office of Emergency Services

Fire and Rescue Branch

California Fire Service and Rescue Emergency Mutual Aid System

Urban Search & Rescue Program

CA-Task Force 1:	Los Angeles City Fire	CA-Task Force 5:	Orange Co. Fire Authority
CA-Task Force 2:	Los Angeles Co. Fire	CA-Task Force 6:	Riverside City Fire
CA-Task Force 3:	Menlo Park FPD	CA-Task Force 7:	Sacramento City
CA-Task Force 4:	Oakland City Fire	CA-Task Force 8:	San Diego City Fire

Arnold Schwarzenegger
Governor

Henry R. Renteria
Director, Governor's Office of Emergency Services

Urban Search & Rescue Program

KIM ZAGARIS, Chief
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URBAN SEARCH AND RESCUE: *DEFINED*

"Urban Search and Rescue (US&R) involves the location, rescue (extrication), and initial medical stabilization of victims trapped in confined spaces. Structural collapse is most often the cause of victims being trapped, but victims may also be trapped in transportation accidents, mines and collapsed trenches."

Urban Search and Rescue is considered a "multi-hazard" discipline, as it may be needed for a variety of emergencies or disasters, including earthquakes, hurricanes, typhoons, storms and tornadoes, floods, dam failures, technological accidents, terrorist activities, and hazardous materials releases. The events may be slow in developing, as in the case of hurricanes, or sudden, as in the case of earthquakes.

A First for California And the Nation

Urban Search and Rescue Task Forces Improve Response Capabilities to Multi-Hazards, including Earthquakes and other Emergencies involving Structural Collapse and Trapped Victims.

The response to rescue people trapped in structural collapses during emergencies and major disasters has been improved by the development of eight Urban Search and Rescue (US&R) Task forces in California.

Under the coordination and management of the California Governor's Office of Emergency Services, Fire and Rescue Branch, the eight US&R Task Forces are part of a nationwide response system, sponsored by the Federal Emergency Management Agency (FEMA). There are 27 such US&R Task Forces across the nation, giving California approximately one-third of the nation's specialized US&R capability. Each Task Force is made up of 62 members, who are specially trained and equipped to perform the required Search, Rescue, Medical and Technical functions. California's Task Forces are strategically located in the state.

OES proposed the concept of US&R task forces after the Loma Prieta earthquake in October, 1989, that caused major injuries and tragic deaths at the Nimitz Freeway incident in Oakland, and at other structural collapses. Previous earthquakes in Mexico City and Soviet Armenia also underscored the need for highly skilled teams to rescue trapped victims. The State and Federal Response System was set in motion in July, 1991.

The US&R Task Forces are designed to be totally self-sufficient for the first 72 hours of an operation, and are capable of sustaining a 10-day mission. Specialized equipment caches for the Task Forces include concrete and steel cutting tools, breaking devices, portable generators, air compressors, power saws, drills, air bags, floodlights, ropes and other technical rescue items, medical supplies, hazardous materials and radiation monitors, protective clothing, victim locating devices, search cameras and portable computers.

The Task Forces can be mobilized within six hours to depart for operations anywhere in California and the United States or its territories.

Role of the Governor's Office of Emergency Services
In
Managing the State of California and National Urban Search and Rescue Response System

The Governor's Office of Emergency Services (OES) is responsible for the overall management and coordination of the state and federal US&R Response System, which includes eight multi-disciplinary Urban Search and Rescue Task Forces in California. The Task Forces are sponsored by local government agencies, and are made up of 62 highly skilled members, who are trained and equipped to perform search, rescue, medical, and technical functions. At this time, the eight California Task Forces are sponsored by fire departments.

OES coordination is provided by the Special Operations section of the OES Fire and Rescue Branch.

OES is the point of contact for mobilization and mission assignments for the eight Task Forces. In addition to California responses, the eight Task Forces can be mobilized to any location in the United States or its territories for US&R operations, through a tri-party agreement between the local sponsoring agencies, the State and FEMA. Requests for out-of-state responses are made to the OES Warning Center in Sacramento. The Warning Center refers the request to the Fire and Rescue Duty Officer. The request is then evaluated using several criteria, including the nature of the mission assignment, current emergency operations in California, the individual task forces' states of readiness, and the effect upon regional, county, and local jurisdictions. The OES Director obtains the Governor's concurrence on deploying the task force(s). If current emergency operations in California will be negatively affected by sending task forces out-of-state, the request may not be filled. No more than four task forces will be dispatched outside California at any one time in order to maintain effective resource readiness within the state. The Task Forces' regional and operational area fire and rescue coordinators are kept informed of the current deployment status through the Fire and Rescue Mutual Aid System. After the Governor and OES Director approve the mission, the activation is made through the fire and rescue mutual aid system. The OES US&R staff makes concurrent calls to the Task Forces with specific details of the mission.

During missions, OES provides at least one state US&R liaison for overhead coordination in the field.

OES responsibilities include all phases of program development, coordination with the federal US&R Response System, and training of the Task Forces. As part of its training program, OES is developing the State US&R Training Center. US&R training will be provided for the US Army Corps of Engineers, the FEMA US&R Response System and

California US&R Task Force personnel. Classrooms and a state-of-the-art "disaster city" are being developed for the critical hands-on training.

OES is responsible for the accounting of federal and state funds obligated for the development of the US&R Response System and for the equipping and training of the Task Forces. OES administers several FEMA grant programs that support the Task Forces.

Overview:
State of California
Governor's Office of Emergency Services
Urban Search and Rescue Program

The catastrophic earthquakes that hit Mexico City (1985) and Soviet Armenia (1988) demonstrated the need for specially trained urban search and rescue (US&R) resources to respond to incidents of structural collapse caused by earthquakes or other major hazards. Locating and rescuing victims trapped in structures requires specialized skills and equipment, and experts from a variety of disciplines who must work together in a coordinated manner in very dangerous and austere environments.

The October 1989 Loma Prieta earthquake caused collapses of the Cypress section of the Nimitz Freeway in Oakland, and structural collapses in San Francisco and Santa Cruz. In late 1989, the State of California Office of Emergency Services developed comprehensive proposal outlining a program to enhance US&R capabilities in the state. The cornerstone of this program was the development of mutli-disciplinary Urban Search and Rescue Task Forces, which would be deployed by OES to rescue victims trapped during major emergencies or large-scale disasters.

At the same time, the Federal Emergency Management Agency (FEMA) began an initiative to upgrade US&R capabilities nationwide, and developed the first coordinated, national US&R network for catastrophic disasters. The national program is based upon the model developed in California.

Throughout 1990, OES enlisted the assistance of experts to develop the US&R response system. These experts came from a variety of disciplines, including the fire service, disaster search dog associations, emergency medicine, and structural engineering. Many Californians were chosen to serve on FEMA-sponsored working groups to ensure compatibility between the state and federal programs.

The National US&R Response System is built upon a foundation of 27 US&R Task Forces strategically located throughout the nation. Eight of these Task Forces are in California, and are sponsored by the following agencies:

Los Angeles City Fire Department
Los Angeles County Fire Department
Menlo Park Fire Protection District
Oakland City Fire Department
Orange County Fire Authority
Riverside City Fire Department
Sacramento City Fire Department
San Diego City Fire Department

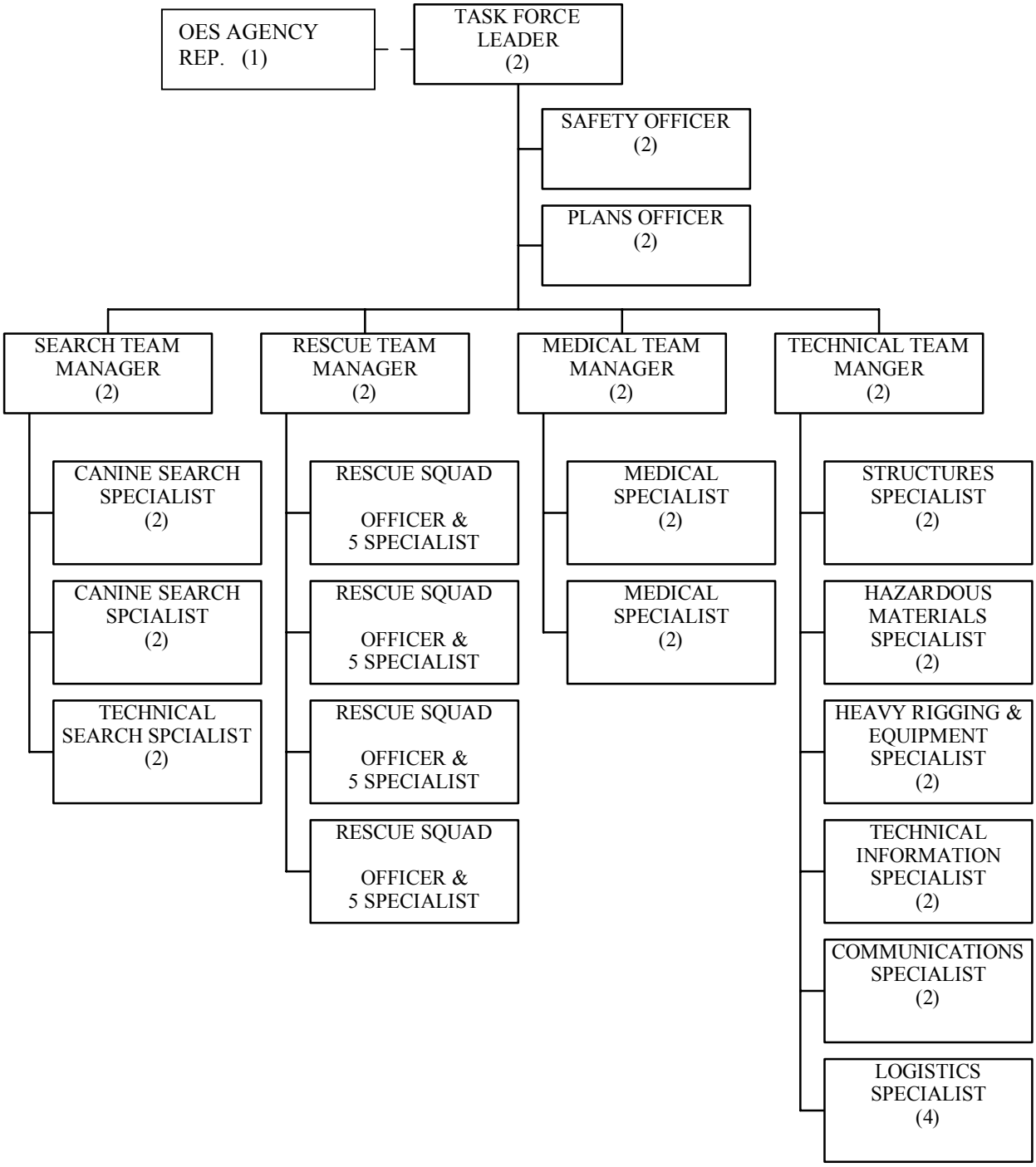
Each 62-member Task Force includes search, rescue medical, and technical elements for an integrated, multi-disciplinary, self-contained approach to successfully locating, rescuing, and medically stabilizing victims of structural collapse.

FEMA supports the national program with training and equipment grants, and California OES has the distinction of being the only state to support its task forces with training and high-dollar, high-tech equipment purchases.

In California, the eight task forces are on a monthly "first-up, on-call" rotation for quick activation. Highly trained and well equipped, these task forces can mobilize within six hours to respond to any incident in California, the United States, or its territories.

State / National US&R Task Force

62 Positions / 24-Hour Operation



Urban Search and Rescue Task Force Position Descriptions

TASK FORCE LEADER

Develops action plans, manages all search and rescue activities, and supervises managers of the search, rescue, medical and technical teams.

Search Team Manager

Develops action plans, manages all search functions and supervises canine and technical search specialists.

> ***Canine Search Specialist***
> Along with a trained disaster search dog, searches collapsed structures, water, debris piles, land and mudslides, or fire areas for trapped victims.
>
> ***Technical Search Specialist***
> Searches collapsed structures, water, debris piles, land and mud slides, or fire areas for trapped victims using appropriate electronic search equipment and techniques.

Rescue Team Manager

Develops rescue action plans, manages the rescue function and supervises Rescue Squad Officers.

> ***Rescue Squad Officer***
> Supervises a squad of five rescue specialists.
>
> ***Rescue Specialist***
> Performs rescue operations, using appropriate rescue tactics and techniques, including rope rescue, confined space rescue, shoring and stabilization, breaching, victim packaging and extrication.

Medical Team Manager

Manages the medical function and supervises the medical specialists.

> ***Medical Specialists***
> Provide medical care to all task force personnel, victims and search dogs.

Technical Team Manager

Manages the technical functions of the task force and supervises the structures, hazardous materials, heavy equipment and rigging, technical information, communications and logistics specialists.

Structure Specialist
Evaluates the immediate structural condition of the area to be entered at the rescue site and advises rescue specialists on entry, shoring and victim extrication techniques.

Hazardous Materials Specialist
Monitors local environmental conditions during rescue operations, and surveys, identifies, and mitigates any hazardous material dangers present at the rescue site. Provides emergency decontamination for task force members and victims.

Heavy Rigging and Equipment Specialist
Assesses the need for and capabilities of various types of construction related equipment. Identifies rigging techniques to assist in victim rescue or building stabilization. Coordinates efforts of heavy equipment and crane operators.

Technical Information Specialist
Documents, tracks and retrieves all pertinent information regarding task force activities for on-site and post-incident analyses, historic documentation and post-event critiques.

Communications Specialist
Assesses communications needs, and manages the task force communications system, including frequency management, installation, operation and maintenance.

Logistics Specialist
Maintains equipment cache for immediate deployment; packages, transports, distributes and maintains equipment during mission assignments; coordinates with military and civilian transport officials; procures non-cacheable items.

Planning Officer
Responsible for the collection, evaluation, dissemination and use of information about the development of the incident and status of resources. Information needed to: 1) understand the current situation, 2) predict probable course of incident events, and 3) prepare alternative strategies and control operations for the incident, assist in the development of the incident action plan.

Safety Officer
To develop and recommend measures for assuring personnel safety, and to assess and/or anticipate hazardous and unsafe situations.

Operational Protocols

KEY TERMS

ALERT: The Task force is notified of a possible activation (mission assignment) to an incident. This is *ONLY* an advisory notice. A general overview of the incident is provided to the Task Force. The Task Force begins an assessment of its available resources, and its ability to respond. Within two hours, the Task Force is asked to provide State OES with its availability assessment for deployment. The Task Force may decline activation if local emergencies require the Task Force personnel and equipment.

ACTIVATION: The Task Force is formally activated by State OES. Specific details are given to the Task Force, including incident information, length of deployment, point of departure, mobilization point, mission numbers, and mission contacts. The Task Force begins to mobilize its personnel and equipment cache. The Task Force has six (6) hours to mobilize and be ready to deploy from the point of departure. In the case of air transportation, the equipment cache must be properly packaged, labeled and palletized per military rules and regulations.

CANCELLATION: The Task Force's activation and mobilization activity may be canceled at any time. Reasons for cancellation may include a reduction of the hazard or threat of hazard, an assessment that urban search and rescue resources are not needed, or if the Task Force is needed for state or local emergency operations.

MISSION PERIOD: Generally, the Task Forces prepare for a mission lasting five to ten days. Task Forces are required to be self-sufficient for the first 72 hours of the mission.

ON-CALL ROTATION

Each of the California US&R Task Forces serve on month as the "On-Call" Task Force in rotation. Should a request for activation occur, the rotation schedule helps prioritize which task force(s) will be mobilized.

CRITERIA FOR MISSIONS

The following factors are considered before any task force is put on alert or activated:

- rotation schedule
- task force readiness and ability to respond
- existing local, county (operational area), regional and statewide incidents and commitments
- applicability of using the specialized urban search and rescue resources

ACTIVATION OF TASK FORCES

1) Incident Occurs:

A determination is made by local officials that urban search and rescue resources are needed.

National: In the case of out-of-state responses, FEMA may determine that there is a need for Task Forces, and may, in consultation with local authorities, request that one or more Task Forces activate. The need may be immediate, as in the case of an earthquake. FEMA may also request activation if there is a serious, imminent threat, as in the case of an approaching hurricane.

California: For incidents within the State of California, assessment decisions are made by State OES, with intelligence from local authorities.

2) Requesting US&R Task Forces:

National: FEMA receives a request for US&R resources, and confirms that those resources are needed. FEMA headquarters in Washington, D.C. approves the activation of one or more US&R Task Forces. FEMA contacts the State Warning Center at OES Headquarters, Sacramento.

California: Local officials determine that extensive US&R resources are needed. The request for a State US&R Task Force can be made through the Fire, Law or Disaster Mutual Aid Systems (local, county operational area, region, OES Headquarters).

3) Requesting Single US&R Task Resources:

California: If full Task Force resources are not required, but limited US&R resources are needed for day-to-day types of incidents, single resources may be requested through the Fire and Rescue Mutual Aid System.

4) Decision to Activate:

The final decision to activate one or more California US&R Task Forces is made by OES Headquarters, after concurrence is obtained from the Governor and the OES Director.

5) Notification Procedures:

National and California: The OES Fire and Rescue Branch activates its US&R mobilization plan, and the one or more Task Forces are notified of the activation through the Fire and Rescue mutual Aid System. Simultaneously, the US&R Program Duty Officer contacts Task Force Liaisons, and briefs them on the details of the activation. The Task Forces activate their internal mobilization plans. The use of the Mutual Aid System helps keep all levels of coordination informed of the status of US&R resources located in their jurisdictions.

6) Overhead Direction and Control:

National and California: A State OES Coordinator deploys with each Task Force to provide liaisons with federal, state and local authorities. Task Force Leaders are in charge of the individual Task Forces. The State Coordinators provide liaison with the Task Force Leaders.

7) On-Scene Direction and Control:

The US&R Task Forces fall under the command of the local Incident commander (I.C.). The Task Force Leader coordinates with the I.C.

National: On out-of-state responses, the Task Forces become federal resources, supported by the Department of Defense. The US&R function and responsibility fall under the Federal Emergency Support Function #9. The Department of Defense works with FEMA in the overall coordination of the US&R Response System.

California: On in-state responses, the Task Forces remain state resources. When on scene, the Task Forces fall under the Operation Branch of the local Incident Command.

8) Mission Parameters:

National and California: The mission of the Task Forces is to locate, extricate, and medically stabilize trapped victims. Once a victim has been rescued and medically stabilized, the victim is put into the care of the local Emergency Medical Service for the incident. The Task Force then moves on to the next assignment. The search, rescue, medical and technical teams of the Task Forces are designed to move as a unit, and will work in one incident area at a time.

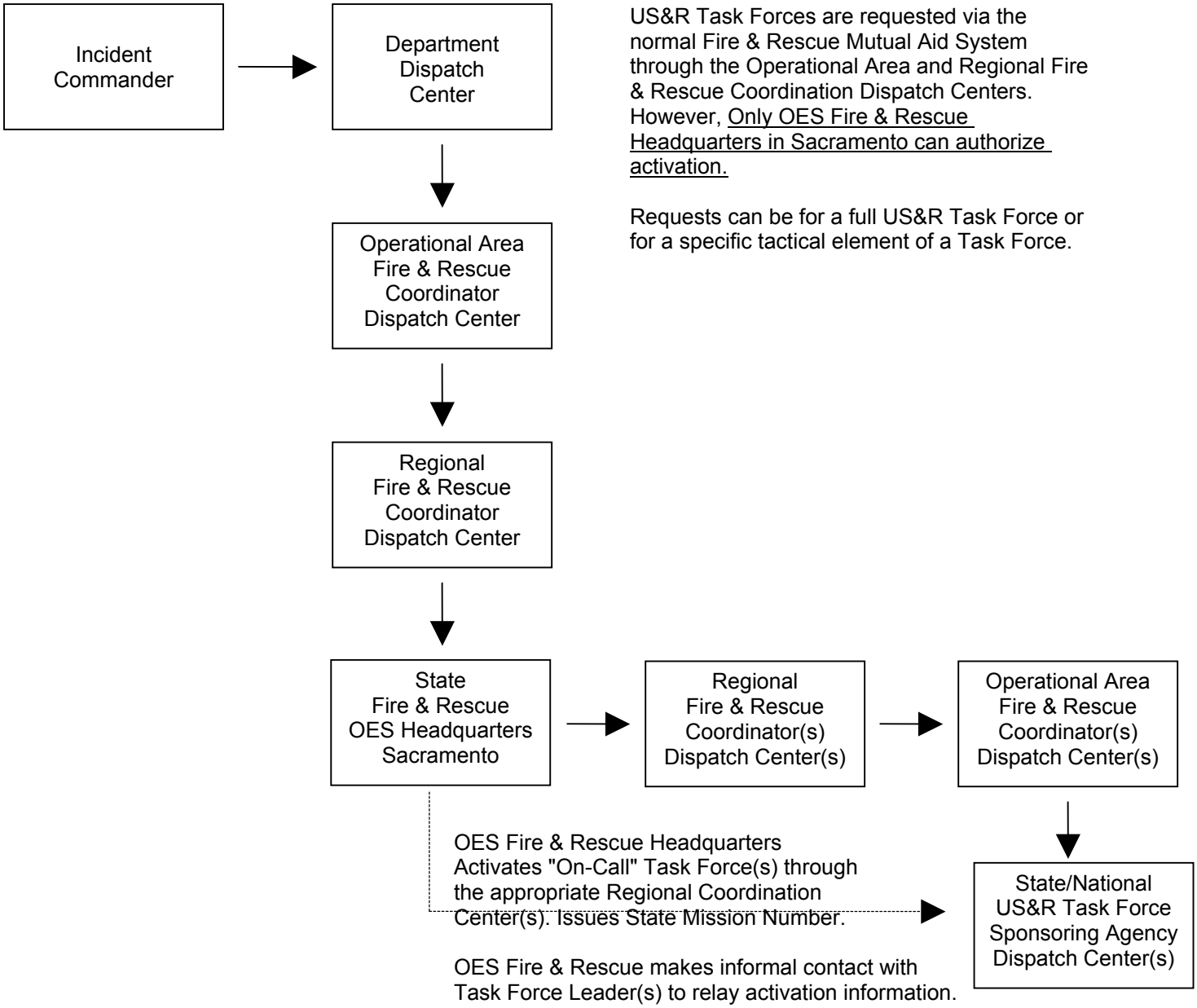
9) Demobilization:

National and California: The demobilization process includes after-action reports, critical incident stress debriefings, and enforced rest periods for personnel before resuming their regular work schedule.

CALIFORNIA FIRE AND RESCUE MUTUAL AID SYSTEM

Procedures for Ordering State/National Urban Search and Rescue Task Forces

"In State Request"



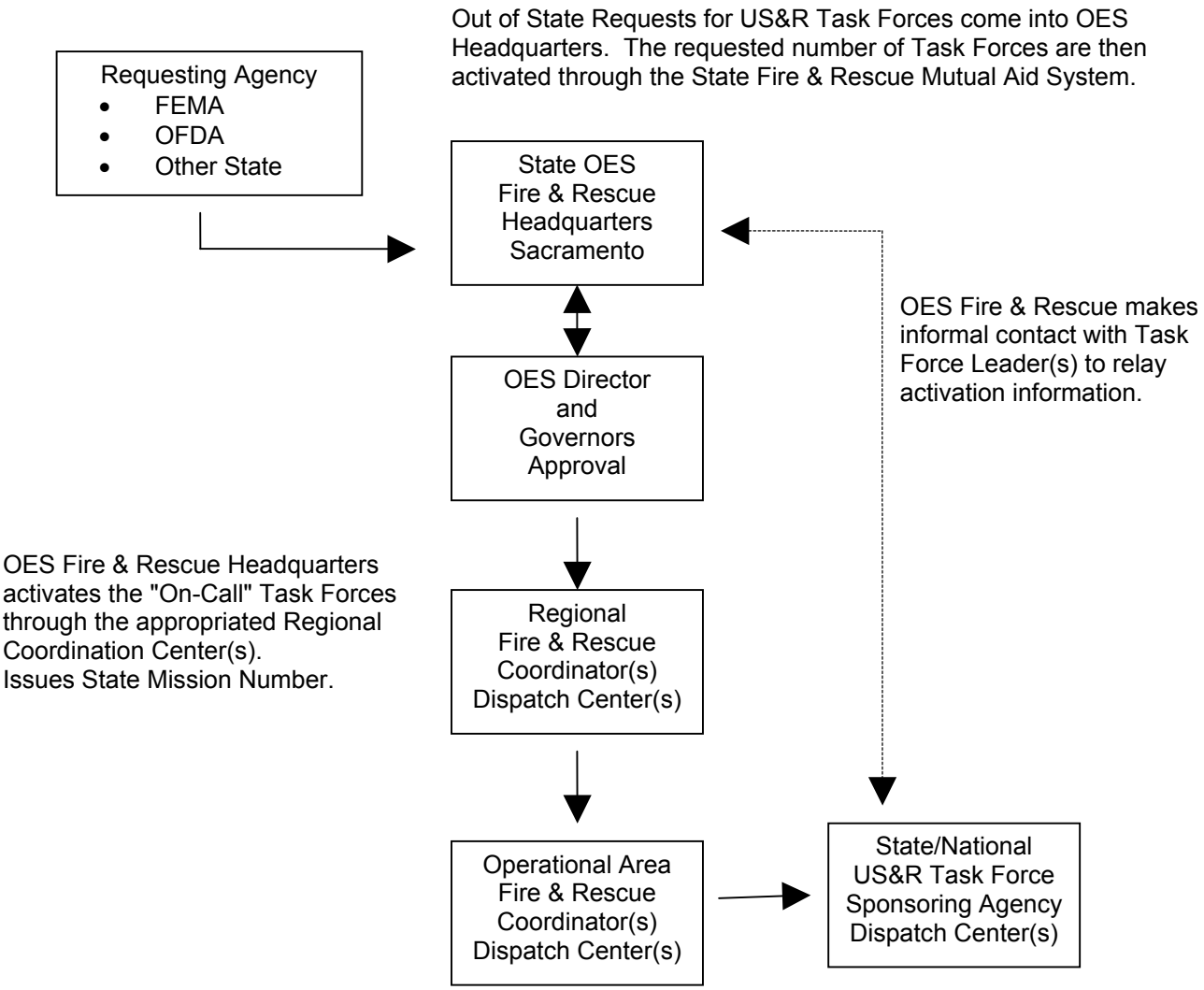
RESOURCE ORDERING & REQUEST INFORMATION:

- TYPE AND NATURE OF INCIDENT OR POTENTIAL SITUATION.
- NUMBER & TYPE OF US&R RESOURCE(S) REQUESTED.
  (Full Task Force or specialized element.)
  (OES will indicate requested Task Force(s) by agency name and Task Force number).
- REQUESTING AGENCY (order and request number if applicable).
- STATE MISSION NUMBER.
- REPORTING LOCATION.

- MUTUAL AID OR TACTICAL RADIO FREQUENCY.
- REQUESTING AGENCY PHONE NUMBER OR ICP CELL PHONE NUMBER.

CALIFORNIA FIRE AND RESCUE MUTUAL AID SYSTEM

Procedures for Ordering State/National Urban Search and Rescue Task Forces "Out of State Request"



<u>RESOURCE ORDERING & REQUEST INFORMATION RELAYED BY OES TO REGIONAL FIRE & RESCUE COORDINATION CENTER(S):</u>

- TYPE AND NATURE OF INCIDENT OR POTENTIAL SITUATION.
- REQUESTING AGENCY.
- TASK FORCE "ALERT", "ACTIVATION" OR "CANCELLATION" NOTIFICATION.
- NUMBER & TYPE OF US&R RESOURCE(S) REQUESTED.
  (Full Task Force or specialized element.)
  (OES will indicate requested Task Force(s) by agency name and Task Force number).
- STATE MISSION NUMBER.
- SPECIAL WEATHER OR INCIDENT CONDITIONS.

GLOSSARY OF TERMS

Basic Operational Level. The Basic level represents the minimum capability to conduct safe and effective search and rescue operations at structure collapse incidents. Personnel at this level shall be competent at surface rescue that involves minimal removal of debris and building contents to extricate easily accessible victims from non-collapsed structures.

Basic Rope Rescue. Rescue operations of a non-complex nature employing the use of ropes and accessory equipment.

Confined Space Rescue. Rescue operations in an enclosed area, with limited access/egress, not designed for human occupancy and has the potential for physical, chemical or atmospheric injury.

Light Operational Level. The Light level represents the minimum capability to conduct safe and effective search and rescue operations at structure collapse incidents involving the collapse or failure of light frame construction and basic rope rescue operations.

Heavy Floor Construction. Structures of this type are built utilizing cast-in-place concrete construction consisting of flat slab panel, waffle or two-way concrete slab 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 structure and multi-purpose facilities. Common heights vary from single story to high-rise structures.

Heavy Wall Construction. Materials used for construction are generally heavy and utilize an interdependent structural or monolithic system. These types of materials and their assemblies 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 non-reinforced masonry (URM) buildings typically of low-rise construction, one to six stories in height, of any type of occupancy.

Heavy Operational Level. The Heavy level represents the minimum capability to conduct safe and effective search and rescue operations at structure collapse incidents involving the collapse or failure of reinforced concrete or steel frame construction and Confined Space Rescue operations.

Light Frame Construction. Materials used for construction are generally lightweight 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.

Medium Operational Level. The Medium level represents the minimum capability to conduct safe and effective search and rescue operations at structure collapse incidents involving the collapse or failure of reinforced and non-reinforced masonry (URM), concrete tilt-up and heavy timber construction.

Pre-cast Construction. Structures of this type are built utilizing modular pre-cast 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.

Search Marking System. A standardized marking system employed during and after the search of a structure for potential victims.

State/National Urban Search & Rescue (US&R) Task Force. A sixty-two-person team specifically trained and equipped for large or complex urban search and rescue operations. The multi-disciplinary organization provides five functional elements that include command, search, rescue, medical and technical. The US&R Task Force is designed to be used as a "single resource" and not disassembled to make use of individual task force elements.

Structure/Hazards Marking System. A standardized marking system to identify structures in a specific area and any hazards found within or near the structure.

Urban Search & Rescue (US&R) Company. Any ground vehicle(s) providing a specified level of US&R operational capability, rescue equipment and personnel.

Urban Search & Rescue (US&R) Crew. A predetermined number of individuals that are supervised, organized and trained principally for a specified level of US&R operational capability. They respond with no equipment and are used to relieve or increase the number of US&R personnel at the incident.

APPENDIX-A

FOUR GENERAL TYPES OF BUILDING CONSTRUCTION

The construction types and occupancy usage of various structures may require the utilization of a variety of different techniques and materials. The four general construction categories the rescuer will most likely encounter in collapse situations are light frame, heavy wall, heavy floor and pre-cast concrete construction. These four general classifications of construction usually comprise the majority of structures affected by collapse and failure.

Light Frame Construction

Materials used for construction are generally lightweight 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.

Heavy Wall Construction

Materials used for construction are generally heavy and utilize an interdependent structural or monolithic system. These types of materials and their assemblies 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 non-reinforced 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 cast-in-place concrete construction consisting of flat slab panel, waffle or two-way concrete slab 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 structure and multi-purpose facilities. Common heights vary from single story to high-rise structures.

Pre-cast Construction

Structures of this type are built utilizing modular pre-cast 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.

APPENDIX-B

FOUR LEVELS OF US&R OPERATIONAL CAPABILITY

Basic Operational Level

The Basic level represents the minimum capability to conduct safe and effective search and rescue operations at structure collapse incidents. Personnel at this level shall be competent at surface rescue that involves minimal removal of debris and building contents to extricate easily accessible victims from non-collapsed structures.

Light Operational Level

The Light level represents the minimum capability to conduct safe and effective search and rescue operations at structure collapse incidents involving the collapse or failure of light frame construction and basic rope rescue operations.

Medium Operational Level

The Medium level represents the minimum capability to conduct safe and effective search and rescue operations at structure collapse incidents involving the collapse or failure of reinforced and non-reinforced masonry (URM), concrete tilt-up and heavy timber construction.

Heavy Operational Level

The Heavy level represents the minimum capability to conduct safe and effective search and rescue operations at structure collapse incidents involving the collapse or failure of reinforced concrete or steel frame construction and Confined Space Rescue operations.

APPENDIX-C

FOUR LEVELS OF US&R OPERATIONAL CAPABILITY

MINIMUM TRAINING

Basic Operational Level

The Basic Operational Level represents the minimum capability to operate safely and effectively at a structural collapse incident. Personnel at this level shall be competent at surface rescue and rescue involving minimal removal of debris and building contents to extricate easily accessible victims from non-collapsed structures. Rescue operations would include removal of victims from under furniture, appliances, and the surface of a debris pile. Training at the basic level should at a minimum include the following:

A. Size-up of existing and potential conditions and the identification of the resources necessary to conduct safe and effective urban search and rescue operations.

B. The process for implementing the Incident Command System (ICS).

C. The procedures for the acquisition, coordination and utilization of resources.

D. The procedures for implementing site control and scene management.

E. The identification, utilization and proper care of personal protective equipment required for operations at structural collapse incidents.

F. The identification of construction types, characteristics and expected behavior of each type in a collapse incident.

G. The identification of four types of collapse patterns and potential victim locations.

H. The recognition of the potential for secondary collapse.

I. Recognition of the general hazards associated with a structural collapse and the actions necessary for the safe mitigation of those hazards.

J. The procedures for implementation of a structural identification marking system and a structural hazard marking system. (Appendix-F)

K. Procedures for conducting searches at structural collapse incidents using appropriate methods for the type of collapse.

L. The procedures for implementation of a search marking system. (Appendix-G)

M. Procedures for the extrication of victims from structural collapse incidents.

N. Procedures for providing initial medical care to victims.

Light Operational Level

Personnel shall meet all Basic level training requirements. In addition, personnel shall be trained in hazard recognition, equipment use and techniques required to operate safely and effectively at structural collapse incidents involving the collapse or failure of light frame construction and basic rope rescue as specified below:

A. Personnel shall be trained to recognize the unique hazards associated with the collapse or failure of light frame construction. Training should include but not be limited to the following:

1. Recognition of the building materials and structural components associated with light frame construction.

2. Recognition of unstable collapse and failure zones of light frame ordinary construction.

3. Recognition of collapse patterns and probable victim locations associated with light frame construction.

B. Personnel shall have a working knowledge of the resources and procedures for performing search operations intended to locate victims who are not readily visible and who are trapped inside and beneath debris of light frame construction. Training should include but not be limited to the following:

1. Types of search resources: Urban Search and Rescue Dogs, Optical Instruments (Search Cameras), Seismic/Acoustic Instruments (Listening Devices).

2. Capabilities of search resources.

3. Acquisition of search resources.

C. Personnel shall be trained in the procedures for performing access operations intended to reach victims trapped inside and beneath debris associated with light frame construction. Training should include but not be limited to the following:

1. Lifting techniques to safely and efficiently lift structural components of walls, floors or roofs.

2. Shoring techniques to safely and efficiently construct temporary structures needed to stabilize and support structural components to prevent movement of walls, floors or roofs.

3. Breaching techniques to safely and efficiently create openings in structural components of walls, floors or roofs.

4. Operating appropriate tools and equipment to safely and efficiently accomplish the above tasks.

D. Personnel shall be trained in the procedures for performing extrication operations involving packaging, treating and removing victims trapped inside and beneath debris associated with light frame construction. Training should include but not be limited to the following:

1. Packaging victims within confined areas.

2. Removing victims from elevated or below grade areas.

3. Providing initial medical treatment to victims at a minimum to the BLS (Basic Life Support) level.

4. Operating appropriate tools and equipment to safely and efficiently accomplish the above tasks.

Medium Operational Level

Personnel shall meet all Light level training requirements. In addition, personnel shall be trained in hazard recognition, equipment use and techniques required to operate safely and effectively at structural collapse incidents involving the collapse or failure of reinforced and non-reinforced masonry (URM), concrete tilt-up and heavy timber construction.

Heavy Operational Level

Personnel shall meet all Medium level training requirements. In addition, personnel shall be trained in hazard recognition, equipment use and techniques required to operate safely and effectively at structural collapse incidents involving the collapse or failure of reinforced concrete or steel frame construction and confined space rescue.

APPENDIX-D

FOUR LEVELS OF US&R OPERATIONAL CAPABILITY

MINIMUM EQUIPMENT LISTS

These lists identify the minimum amount of tools and equipment needed to provide a safe and acceptable level of service for each of the four levels of US&R operational capability. The amount, size and type of equipment listed can be increased to provide a higher degree of safety and service in each level of US&R operational capability.

US&R BASIC LEVEL

(Minimum Equipment List)

2	8-10 LB Sledge Hammer
2	3-4 LB Sledge Hammer
2	Cold Chisel (1" X 7 7/8")
4	Pinch Point Pry Bar (60")
2	Claw Wrecking Bar (3 ')
2	Hacksaw (Heavy Duty)
3	Carbide Hacksaw Blade Package
2	Crosscut Handsaw (26")
1	Cribbing & Wedge Kit (See Tool Info Sheet)
1	First Aid Kit (See Tool Info Sheet)
1	Trauma Kit (See Tool Info Sheet)
2	Blanket (Disposable)
1	Backboard w/ 2 Straps
1	Bolt Cutter (30")
1	Scoop Shovel "D" Handle
1	Building Marking Kit (See Tool Info Sheet)
1	Axe (Flat Head)
1	Axe (Pick Head)

US&R LIGHT LEVEL

(Minimum Equipment List)

1	US&R Basic Equipment Inventory
2	150' X 1/2" Kernmantle, Static, NFPA Approved
2	Friction Device (See Tool Info Sheet)
12	Carabiner (Locking "D", 11 mm)
6	Camming Devices (See Tool Info Sheet)
3	Pulley, Rescue (2" or 4")
1	Litter & Complete Pre-rig (See Tool Info Sheet)
1	Webbing Kit (See Tool Info Sheet)
2	Edge Protection (See Tool Info Sheet)
2	Pick Off Straps (See Tool Info Sheet)
2	Commercial Harness (Class II or better)
6	Steel Pickets (1" X 4')
2	3-4 LB Short Sledge Hammer
1	Chain saw (See Tool Info Sheet)
3	Tape Measure (25')
1	Shovel, Long Handle SQ Pt.
1	Shovel, Long Handle RD Pt.
2	Framing Hammer (24 oz)
2	Tri or Speed Square
2	Carpenter Belts
1	Nails (See Tool Info Sheet)
2	Hydraulic Jacks (minimum 5 Ton)
2	Rolls Duct Tape

US&R MEDIUM LEVEL

(Minimum Equipment List)

1	US&R Basic Equipment Inventory & Light Equipment Inventory
1	Air Bag Set (3 Bag, 50 Ton w/ 3 spare air bottles)
1	Bolt Cutters (Heavy Duty, 42")
1	Generator (5 KW)
4	Floodlight (500 WT)
6	Extension Cords (50')
1	Junction Box (4 Outlet w/ GFI)
1	Wye Electrical Adapter
1	Circular Saw (12") w/ 2 1/2 GL fuel
2	Circular Saw Blades (12" Carbide Tip)
12	Circular Saw Blades (12" Metal Cutting)
2	Circular Saw Blade (12" Diamond, Continuous Rim)
1	Pressurized Water Spray Can
1	Rotary Hammer (1 1/2")
1	Rotary Hammer Bit Kit (See Tool Info Sheet)
1	Anchor Kit (See Tool Info Sheet)
1	Saw, Electric (10 1/4")
2	Skill Saw Blade (10 1/4" Carbide Tip)
12	Skill Saw Blade (10 1/4" Metal Cutting)
1	Sawsall
12	Sawsall Blades (Wood)
18	Sawsall Blades (Metal)
2	Rope (300' X 1/2")(Static Kernmantle NFPA Approved)
2	Rope (20' X 1/2")(Static Kernmantle NFPA Approved)
3	Pulley, Rescue (2" or 4")
2	Friction Device (See Tool Info Sheet)
12	Carabiner (Locking "D", 11 mm)
1	Webbing Kit (See Tool Info Sheet)
1	Etrier Set
2	Commercial Harness (Class II or Better)
2	Shovel, Folding, Short
4	Haul Buckets (Metal or Canvas)
8	Ellis Clamps
1	Ellis Jack
8	4' X 4' X 8' Lumber
6	Screw Jacks, Pairs (1 1/2")
1	Pipe Cutter, Multi-Wheel (1 1/2")
6	Pipe (6' X 1 1/2", Schedule 40)
2	Hi-Lift Jack w/ Extension Tube
1	Cribbing & Wedge Kit (See Tool Info Sheet)
1	Come Along (2/4 Ton)
1	Chain Set (See Tool Info Sheet)

US&R MEDIUM LEVEL

(Minimum Equipment List)

-Continued-

1 Tool Kit (See Tool Info Sheet)
1 Demolition Hammer, Small (See Tool Info Sheet)
1 Demolition Hammer, Large (See Tool Info Sheet)
1 Electrical Detection Device (See Tool Info Sheet)
1 Ventilation Fan (See Tool Info Sheet)
1 3 Range Air Monitor

US&R HEAVY LEVEL

(Minimum Equipment List)

1	US&R Basic Equipment Inventory
1	US&R Light Equipment Inventory
1	US&R Medium Equipment Inventory
6	SCBA (with PAL & 1 Spare Bottle each)
3	Supplied Air Breathing Apparatus (SABA)
	Umbilical System w/ Escape Bottles & 250' hose each
1	3 Range Air Monitor
1	Tri Pod (Human Rated, 7' - 9' w/ hauling system)
2	Full Body Harness (Class III or Better)
1	Ventilation Fan (See Tool Info Sheet)
1	Circular Saw (16") w/ 2 1/2 GL fuel
2	Circular Saw Blade (16" Diamond, Continuous Rim)
2	Circular Saw Blade (16" Carbide Tip)
1	Pressurized Water Spray Can
6	Canister Type Respirators
24	Replacement canisters for Respirators
1	Generator (5 KW)
4	Floodlight (500 WT)
6	Extension Cords (50')
1	Junction Box (4 Outlet w/ GFI)
1	Wye Electrical Adapter
1	Rotary Hammer (1 1/2")
1	Rotary Hammer Bit Kit (See Tool Info Sheet)
1	Sawsall
12	Sawsall Blades (Wood)
18	Sawsall Blades (Metal)
1	Drill (1/2", variable speed)
1	Drill Bit Set (Steel, 1/8" - 5/8")
1	Drill Bit Set (Carbide Tip, 1/4" - 5/8")
1	Chain Saw, 12" Electric w/ spare carbide tip chain
	If <u>not</u> already present from Light Inventory
1	Rebar Cutter (1" capacity)
1	Cutting Torch (See Tool Info Sheet)
1	Come Along (2/4 ton)
1	Demolition Hammer, Small (See Tool Info Sheet)
1	Demolition Hammer, Large (See Tool Info Sheet)
1	Extrication Stretcher for Confined Areas
2	Shovel, Folding, Short
1	Mechanical Axe (High Voltage)
1	Mechanical Grabber (High Voltage)
2	Pair Lineman Gloves (High Voltage)
1	Upgrade High Pressure Air Bags to a Total of 245 Tons

US&R HEAVY LEVEL

(Minimum Equipment List)

-Continued-

1	Air Bag Regulator, Control Valve w/ 2 additional hose
2	Building Marking Kits (See Tool Info Sheet)
1	Cribbing & Wedge Kit (See Tool Info Sheet)
1	Ram Set Powder Actuated Nail Gun (w/ 150 red charges)
1	Box Ram Set Nails w/ Washers (2 1/2")
1	Box Ram Set Nails w/ Washers (3 1/2")
1	Green Stone Wheel (to sharpen carbide tips on tools)
1	Nails (See Tool Info Sheet)
2	Tri or Speed Squares
2	Framing Hammers (24 oz)
2	Carpenter Belts
1	Level (6")
1	Level (4')
1	Nail Gun, Pneumatic (Framing Type, 6p-16p)
1	Case Nail Gun Nails (8p)
1	Case Nail Gun Nails (16p)
32	Ellis Clamps
1	Ellis Jack
8	Post Screw Jacks
12	Screw Jacks, Pairs (1 1/2")
12	Pipe (6' X 1 1/2", Schedule 40)
12	Steel Pickets (1" x 4')
1	Case Orange Spray Paint (Line marking, downward application type)
1	Case Duct Tape
1	Technical Search Device (See Tool Info Sheet)
1	Hydraulic Rescue Tool (See Tool Info Sheet)

APPENDIX-F

STRUCTURE/HAZARDS MARKING SYSTEM

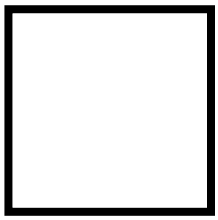
The identity and location of individual structures is crucial at incidents involving several structures or large areas of damage. The use of existing street names and addresses should always be considered first. If due to damage this is not possible, use the existing hundred block and place all even numbers on one side of the street and all odd numbers on the other side. Mark the new numbers on the front of the structure with orange spray paint. If due to damage the name of the street is not identifiable start with the letter "A" using the phonetic alphabet "Alpha", "Bravo", Charlie, etc.

Structure hazards identified during initial size up activities and throughout the incident should be noted. This Structure/Hazards Mark should be made on the outside of all normal entry points. Orange spray paint seems to be the most easily seen color on most backgrounds and line marking or downward spray cans apply the best paint marks. Lumber chalk or lumber crayons should be used to mark additional information inside the search mark itself because they are easier to write with that spray paint.

A large (approximately 2') square box should is outlined at any entrance accessible for entry into any compromised structure. Use orange paint for this marking. Specific markings will be clearly made adjacent to the box to indicate the condition of the structure and any hazards found at the time of this assessment. Normally the square box marking would be made immediately adjacent to the entry point identified as safe. An arrow will be placed next to the box indicating the direction of the safe entrance if the Structure/Hazards marking must be made somewhat remote from the safe entrance.

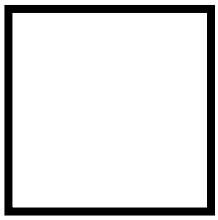
STRUCTURE/HAZARDS MARKINGS

Make a large (2' x 2') square box with orange spray paint on the outside of the main entrance to the structure. Put the date, time, hazardous material conditions and team or company identifier outside the box on the right hand side. This information should be made with lumber crayon or lumber chalk.



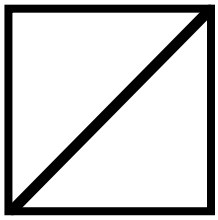
9/12/93
1310 hrs.
HM - nat. gas
SMA - E-1

Structure is accessible and safe for search and rescue operations. Damage is minor with little danger of further collapse.



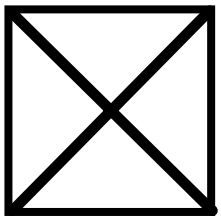
9/12/93
1310 hrs.
HM - none
SMA - E-1

Structure is significantly damaged. Some areas are relatively safe, but other areas may need shoring, bracing, or removal of falling and collapse hazards.



9/12/93
1310 hrs.
HM - nat. gas
SMA - E-1

Structure is not safe for search or rescue operations. May be subject to sudden additional collapse. Remote search ops may proceed at significant risk. If rescue ops are undertaken, safe haven areas and rapid evacuation routes should be created.



9/12/93
1310 hrs.
HM - nat. gas
SMA - E-1

Arrow located next to a marking box indicates the direction to a safe entrance into the structure, should the marking box need to be made remote from the indicated entrance.

APPENDIX-G

SEARCH MARKING SYSTEM

Search Markings must be easy to make, easy to read and easy to understand. To be easily seen the search mark must be large and of a contrasting color to the background surface. Orange spray paint seems to be the most easily seen color on most backgrounds and line marking or downward spray cans apply the best paint marks. Lumber chalk or lumber crayons should be used to mark additional information inside the search mark itself because they are easier to write with that spray paint.

A large distinct marking will be made outside the main entrance of each building or structure searched. This "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. After the search of the entire structure has been completed a second large slash shall be drawn in the opposite direction forming an "X". Specific information will be placed in all four quadrants of the Main Entrance "X" summarizing the entire search of the structure. The left quadrant is for the Rescue Team Identifier. The top quadrant is for the date and time the search was completed. The right quadrant is for any significant hazards located in the structure. The bottom quadrant is for the number of "LIVE" or "DEAD" victims still inside the structure. 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 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.

SEARCH MARKINGS

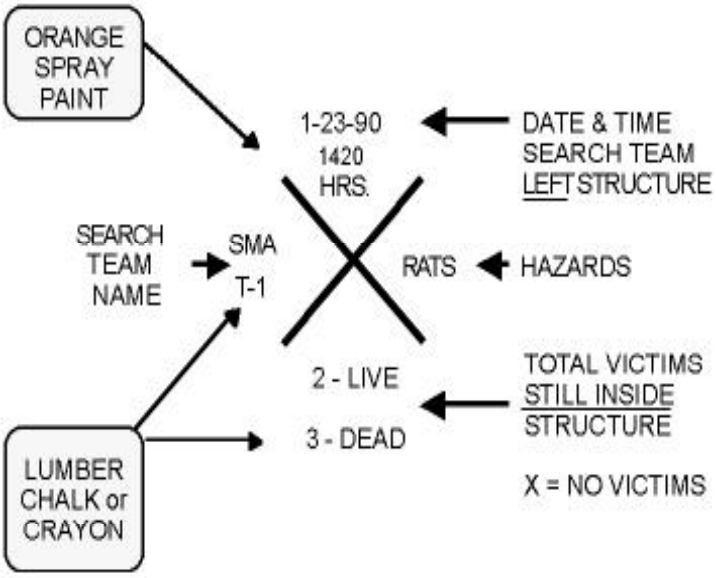
WHEN YOU ENTER

SINGLE SLASH
STRUCTURE OR ROOM

WHEN YOU EXIT

SECOND SLASH
STRUCTURE OR ROOM
(Identify Victims & Hazards)

MAIN ENTRANCE SEARCH MARKING



State of California

Urban Search and Rescue Task Forces