

SEARCH AND RESCUE (LAND-BASED)

Capability Definition

Search and Rescue (Land-based) is the capability to coordinate and conduct search and rescue (SAR) response efforts for all hazards, including searching affected areas for victims (human and, to the extent no humans remain endangered, animal) and locating, accessing, medically stabilizing, and extricating victims from the damaged area.

Outcome

The greatest numbers of victims (human and, to the extent that no humans remain endangered, animal) are rescued and transferred to medical or mass care capabilities, in the shortest amount of time, while maintaining rescuer safety.

Relationship to National Response Plan Emergency Support Function (ESF)/Annex

This capability supports the Emergency Support Function (ESF) #9: Urban Search and Rescue.

Preparedness Tasks and Measures/Metrics

Activity: <i>Develop and Maintain Plans, Procedures, Programs, and Systems</i>	
Critical Preparedness Tasks	
Res.B4a 1.1.1	Incorporate Search and Rescue (SAR) plans and procedures for urban, civil, and other search and rescue into jurisdiction’s Emergency Operations Plan (EOP) or EOP Annexes
Res.B4a 1.3.2	Pre-identify typed SAR resources
Res.B4a 1.3.3	Develop resource allocation processes and procedures for SAR capable resources that also support other capabilities/functions
Res.B4a 1.3.4	Identify resources from other agencies or capabilities that may assist with SAR, and plan to integrate such additional resources as necessary
Res.B4a 1.2.1	Develop plan to incorporate nationally certified SAR volunteers
Res.B4a 1.2.2	Develop management plan to address uncertified volunteers
Res.B4a 1.1.2	Develop plan for SAR teams that will be deployed out-of-region to be self-sustaining for 72 hours
ResB4a 1.2	Establish plans, procedures and protocols for logistical support for search and rescue assets.

Preparedness Measures	Metrics
Scale of jurisdiction’s urban search and rescue capability is related to risk/threat analysis	Yes/No
Team is equipped in accordance with the National Incident Management System (NIMS) Resource Typing System	Yes/No
Federal, State, regional, and local SAR Capabilities are NIMS Compliant	Yes/No
SAR plans address logistical support (e.g. directing resources, re-assigning tech-specialists, managing uncertified volunteers).	Yes/No
Plans address demobilization of SAR operations (e.g. replenishing supplies and equipment, re-assigning personnel).	Yes/No
Plans address SAR personnel needs (e.g. physical, psychological, financial assistance).	Yes/No
SAR plans are integrated with the incident management structure (e.g. USAR teams coordinated with fatality management and EMS resources).	Yes/No
SAR plans address information sharing requirements	Yes/No

Activity: <i>Develop and Maintain Training and Exercise Programs</i>	
Critical Preparedness Tasks	
Res.B4a 2.1.1	Establish training and exercise program for SAR personnel as per EOP
Res.B4a 2.1.2	Train and equip SAR personnel to the appropriate standards commensurate with their mission
Preparedness Measures	Metric
Training program has been established	Yes/No
Training and exercises programs address both urban and civil search and rescue	Yes/No
SAR personnel trained and equipped as per EOP and SOPs	Yes/No
Frequency with which SAR activities are exercised in large and complex exercises	Every 12 months

Performance Measures and Metrics and Critical Tasks

Activity: <i>Direct Search & Rescue Tactical Operations</i>	
Definition: In response to notification of entrapment, provide management and coordination of SAR capability, through demobilization for single or multiple teams	
Critical Tasks	
Res.B4a 3.1	Receive and accept SAR request/activation order
Res.B4a 3.2	Participate in SAR planning process and operational briefings
Res.B4a 3	Plan and coordinate SAR operations at incident site
Res.B4a 3.4.1	Direct SAR resources according to the National Incident Management System (NIMS), the Incident Command System (ICS), and consensus-level technical rescue standards

Res.B4a 3.4.3	Determine need for deployment of additional SAR assets	
Res.B4a 3.6.1	Provide timely situational awareness and response information	
Res.B4a 3.6.1.1	Establish and maintain a chronological log of events in the field	
Res.B4a 3.6.2	Document and collect SAR operations information, including chronological log of events in the field for use in after action review	
Res.B4a 3.7.3	Re-assign/rotate technical specialists, as needed	
ResB4a 3.3.3	Maintain accountability of all SAR personnel	
Res.B4a 3.2.1	Identify logistics capability of incident site to determine whether deployed SAR teams must be self-sustaining	
Res.B4a 3.7	Develop SAR team reassignment/demobilization plan	
Performance Measures		Metric
SAR teams are incorporated into the incident command structure		Yes/No
Frequency with which situation and resource status information are received (and also after a significant change)		Every 30 minutes
Number of loss-time injuries per deployment of SAR personnel during SAR efforts		<1
Time in which tactical plan is developed and implemented by State, regional, and/or local SAR, based on the Incident Action Plan (IAP)		Within 2 hrs from arrival on-scene
Time in which tactical plan is developed and implemented by Federal SAR resource(s) based on the (IAP)		Within 4 hrs from arrival on-scene
Demobilization/reassignment plan is developed and takes into account long-term personnel follow-up		Yes/No

Activity: *Activate Search & Rescue*

Definition: In response to notification, mobilize and arrive at the incident scene to begin operations

Critical Tasks

Res. B4a 3.1	Receive Search and Rescue (SAR) alert/activation order	
Res.B4a 4.3	Participate in Search and Rescue (SAR) planning process and operational briefings	
Res.B4a 4.2	Initiate mobilization procedure	
Res.B4a 4.2.1	Assemble personnel and equipment at designated location	
Res.B4a 4.1.2	Deploy Federal, State, regional or local SAR resources commensurate with request	
Res.B4a 4.2.2	Transport team (personnel and equipment) to incident scene	
Res.B4a 4.2.3	Collect and analyze incident information to assist SAR capability deployment decisions	
Performance Measures		Metric
Time in which local SAR capability arrives on-scene		Within 2 hours from notification
Time in which regional SAR capability arrives on-scene		Within 12 hours from

	notification
Time in which federally designated SAR capable resources are deployed	Within 6 hours from task force notification of request
Time in which first activated Federal SAR resources arrive on-scene	Within 24 hours from activation

Activity: *Provide Materiel and Other Support*

Definition: Upon arriving on scene, provide, track, and maintain equipment and supplies as well as support base of operations

Critical Tasks

Res.B4a 4.3	Participate in SAR planning process and operational briefings	
Res.B4a 5.1	Establish base of operations	
Res.B4a 5.2	Maintain accountability of team equipment/supplies	
Res.B4a 5.1.1	Provide medical care for SAR personnel, including the K-9 first responders	
Performance Measures		Metric
Time in which functional Base of Operation is established and ready to support initial SAR operations		Within 60 minutes from arrival at incident site
Percent of accountability for team equipment/supplies maintained		100%
Percent of deployable SAR capability that can sustain its own operations for up to 72 hours without additional resources		100%
Percent of SAR personnel and service animals whose health is monitored at least once per work cycle		100%

Activity: *Conduct Search and Rescue Reconnaissance*

Definition: Once on scene and equipped, provide rapid assessment of assigned SAR work areas and recommend search priorities/tactics to management

Critical Tasks

Res.B4a 6.1.1	Assess incident site to determine search and rescue course of action	
Res.B4a 6.1.2	Assess the incident site for hazardous materials (hazmat) or other environmental conditions	
Res.B4a 6.1.3	Develop map of search area to be used in SAR tactical operations	
Res.B4a 6.3	Communicate findings and recommend priorities to Team Management	
Performance Measures		Metric
Time in which reconnaissance team provides preliminary recommendation on search priorities and strategy		Within 1 hour

Activity: Search	
Definition: Upon being assigned search area, begins search operations	
Critical Tasks	
Res.B4a 4.3	Participate in SAR planning process and operational briefings
Res.B4a 7.1	Ensure scene/site safety (security, shoring, debris)
Res.B4a 7.2	Conduct area search for victims
Res.B4a 7.2.1	Search for victims using canine, physical, and electronic search capabilities
Res.B4a 7.2.2	Identify and record potential/actual victim locations (live and dead)
Res.B4a 7.3	Direct ambulatory victims to safe assembly point
Res.B4a 7.4	Report progress of search efforts on a regular basis to SAR lead
Res.B4a 7.5	Maintain accountability for search personnel, equipment, and supplies
Performance Measures	Metric
Percent of assigned area searched	100%
Time in which systematic search of an area affected by a large-scale emergency is initiated	Within 30 minutes from operations briefing
Percent of ambulatory victims directed to safe assembly point	100%
Frequency with which updated situation and resource status report is provided (including after major change in conditions)	Every 30 minutes

Activity: Extricate	
Definition: Upon notification of location of victim, perform extrication	
Critical Tasks	
Res.B4a 4.3	Participate in SAR planning process and operational briefings
Res.B4a 7.1	Ensure scene/site safety (security, shoring, debris)
Res.B4a 8.1.1	Coordinate extrication strategy with medical personnel
Res.B4a 8.1	Extricate trapped victims
Res.B4a 8.2	Provide periodic progress reports while rescuing
Res.B4a 8.3	Maintain accountability of extrication personnel, equipment, and supplies
Performance Measures	Metric
Percent of dangerous conditions affecting extrication mitigated to allow worker and victim safety in accordance with SOP	100%
Frequency with which updated situation and resource status report is provided (including after major change in conditions)	Every 30 minutes
Percent of located victims extricated	100%

Activity: Provide Medical Treatment

Definition: Upon access to victim, coordinate with medical personnel to treat and transfer victim to more definitive medical care

Critical Tasks

Res.B4a 4.3	Participate in SAR planning process and operational briefings	
Res.B4a 9.1.1	Coordinate medical treatment with extrication and medical personnel	
Res.B4a 9.2	Transfer victims to more definitive medical care	
Res.B4a 9.1.2	Medically stabilize trapped victims according to Task Force Operations Manual and Medical Protocols	
Res.B4a 9.1.2.1	Ensure victims are medically stabilized according to Task Force Operations Manual and Medical Protocols throughout packaging and extrication	
Res.B4a 9.3	Maintain accountability of medical personnel, equipment, and supplies	
Performance Measures		Metric
Percent of victims whose standard of care is maintained according to local medical protocols		100%
Percent of time resources were identified to transfer patient to more definitive medical care		100%

Activity: Demobilize/Redeploy

Definition: Upon completion of assigned mission, disengage from incident site, and debrief personnel.

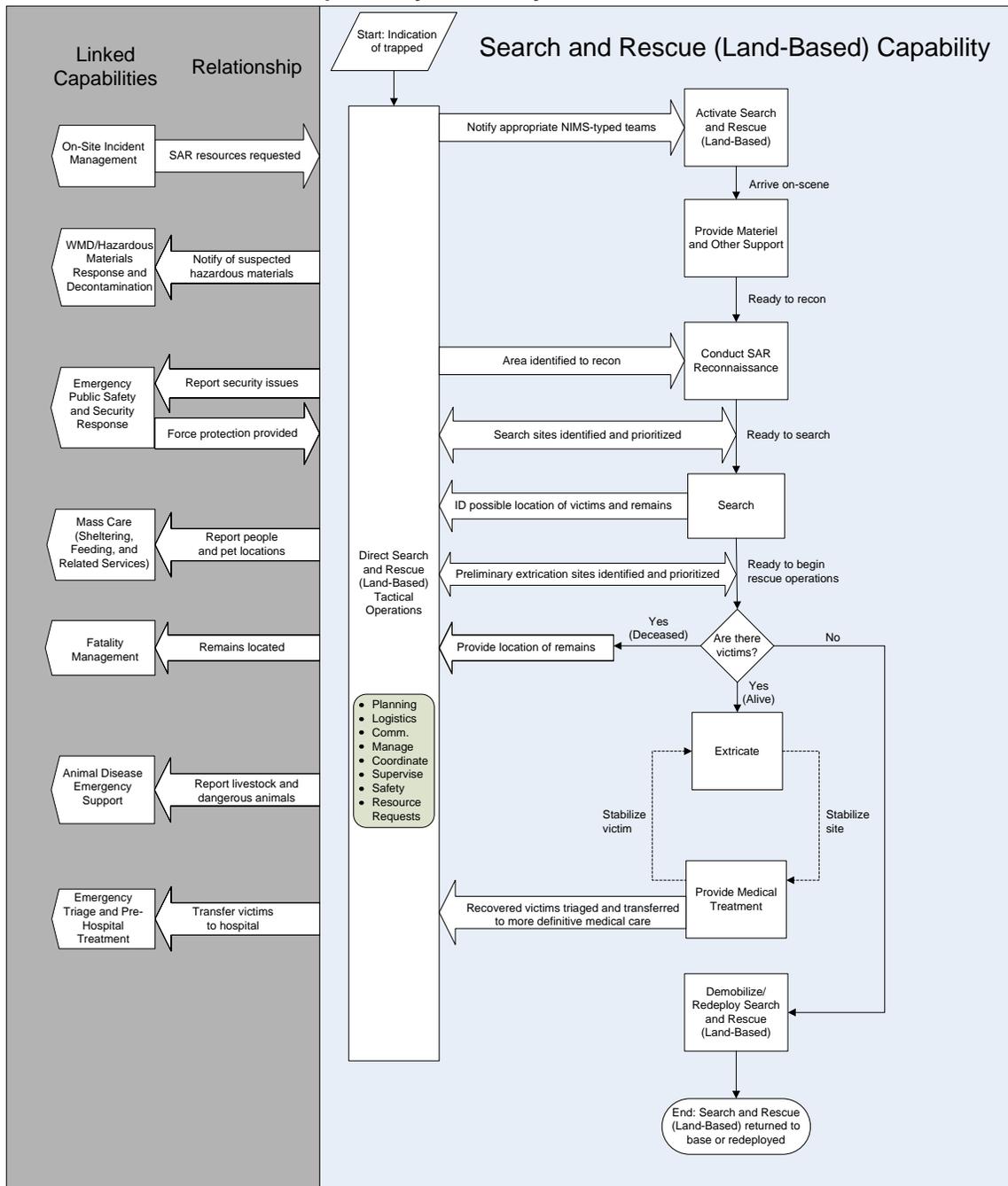
Critical Tasks

Res.B4a 10.2.1	Repackage equipment cache	
Res.B4a 10.2	Demobilize base of operations	
Res.B4a 10.1.1	Arrange transportation for personnel and equipment	
Res.B4a 10.1.2	Debrief SAR capability personnel	
Performance Measures		Metric
Time in which equipment cache is re-inventoried and packaged for transport		Within 12 hours from start of demobilization
Time in which base of operations is returned to original conditions		Within 12 hours from start of demobilization process
Percent of Search and Rescue task force personnel debriefed before leaving the scene		100%

Linked Capabilities

Linked Capability	Relationship
On-Site Incident Management	Search and Rescue (Land-Based) integrates itself into the local Incident Command/Unified Command system.
WMD and Hazardous Materials Response and Decontamination	Search and Rescue (Land-Based) coordinates with WMD and Hazardous Materials Response and Decontamination to identify hazardous conditions, ensure SAR members have appropriate protective clothing and equipment, and ensure SAR personnel and equipment are appropriately decontaminated.
Emergency Triage and Pre-Hospital Treatment	Search and Rescue (Land-Based) coordinates with Emergency Triage and Pre-Hospital Treatment to ensure medical care of victims during and after extricated.
Emergency Public Safety and Security Response	Search and Rescue (Land-Based) relies upon Emergency Public Safety and Security Response assistance to secure search and rescue sites, safely divert public from the area, and to provide security support for the SAR Base of Operations.
Mass Care (Sheltering, Feeding, and Related Services)	Search and Rescue (Land-Based) notifies Mass Care of location of people and companion animals encountered during course of search and rescue operations
Animal Disease Emergency Support	Search and Rescue (Land-Based) notifies Animal Disease Emergency Support of location of livestock, dangerous animals, and injured wildlife encountered during course of search and rescue operations.
Fatality Management	Search and Rescue (Land-Based) notifies Fatality Management of location of remains encountered during search and rescue operations.
Responder Safety and Health	Search and Rescue (Land-Based) relies upon responder health and safety for site hazards to help ensure that appropriate precautions are identified and that personal protective equipment/supplies are available to protect SAR personnel.

Capability Activity Process Flow



Resource Element Description

Resource Elements	Components and Description
Type I US&R Task Force (TF)	Per NIMS
Type II Collapse Search and Rescue Team	Per NIMS
Type II Heavy Rescue Strike Team	Per NIMS
Type II Heavy Rescue Squad	Per NIMS
Type I Large Animal Rescue Strike Team	Per NIMS
Type I Small Animal Rescue Strike Team	Per NIMS

Planning Assumptions

General

- Although applicable to several of the 15 National Planning Scenarios, the capability planning factors were developed from an in-depth analysis of the Toxic Industrial Chemical scenario. Other scenarios were reviewed to identify required adjustments or additions to the planning factors and national targets.
- This capability applies to a wide range of incidents and emergencies, including improvised nuclear devices, toxic industrial chemical scenarios, major earthquakes or hurricanes, and radiological dispersal devices. The primary condition affecting the performance of the capability is whether the incident requires an urban search and rescue or water search and rescue. For urban search and rescue, conditions affecting the performance include the number and size of collapsed structures, number of trapped persons in collapsed structures, and any risks involved for the rescuers (including fire and potential hazardous materials (hazmat) exposure).
- Local response time: 0–2 hours
- Regional response time: 2–17 hours
- State response time: 12–24 hours
- Federal response time: 24+ hours
- Given that SAR is extremely time-sensitive, initial operations will be undertaken by State and local responders and those volunteer personnel willing to assist in locating victims. If the catastrophic incident involves collapsed buildings, national SAR task force response assets will immediately deploy in accordance with the Catastrophic Incident Response Execution Schedule (Annex 1).
- All injuries and fatalities need to be extricated.
- All locations need hazmat assessment for proper personal protective equipment (PPE).
- Typical fire and hazmat response has PPE to extricate lightly trapped victims.
- US&R strike teams begin to extricate moderately trapped victims.
- US&R task forces extricate heavily trapped victims.
- Trapped victims surviving the initial exposure will be viable.
- Trapped victims have the best chance of survival if they are rescued within 72 hours. They may survive up to 14 days if provided drinking water.
- The doctrine of “do no additional harm” will apply to all SAR operations. Urban search and rescue personnel will take into consideration the dangers of contamination and unstable physical structures before entering into an area that may contain surviving victims and will take appropriate safety and protective measures before commencing operations.

- The size of the jurisdiction and the risks/threats presented will determine how extensive the SAR capability needs to be.
- Jurisdictions may be able to obtain SAR resources that are sufficient to meet that jurisdiction's needs from elsewhere.
- Training should be commensurate with population and risk.
- SAR resources may not be available due to other incidents or activities in the area.
- Location, distance, available transportation, and weather affect how quickly SAR resources can reach the scene.
- Type of SAR resources deploying will affect what type of equipment it has and how long it can conduct SAR operations without re-supply.
- When there is a base camp with sufficient resources SAR teams may not need to be self-sustaining.
- Hazardous conditions, weather, size of area, scope, access, criminal activity (hazard) determines level of work-area access and efficiency with which areas can be searched for victims.
- Complexity and circumstances of the entrapment affects the amount of time required to safely access, stabilize, and extricate victim.
- Not all SAR resources have integrated confined space medical components thus the care available to the victim will depend on the type of SAR team providing treatment throughout the extrication process.
- Intensity of equipment and personnel utilization will increase or decrease duration each US&R capability is able to work.
- The level of effort required to restore (or replace) equipment cache items will depend on how heavily they were used and the extent to which they need to be decontaminated/cleaned.

Planning Factors from an In-Depth Analysis of a Scenario with Significant Demand for the Capability (Toxic Industrial Chemical)

Resource Organization	Estimated Capacity	Scenario Requirement Values	Quantity of Resources Needed
Type I US&R Task Force	Extrication of victims in 24 hrs: Heavy construction (HC): Entombed: 4 Structurally trapped: 12 Nonstructurally trapped: 20 Light construction (LC): Entombed: 8 Structurally trapped: 24 Nonstructurally trapped: 40	HC: 20 maximum rescued per day LC: 40 maximum rescued per day	1350 victims trapped 50% trapped in HC (675) 675 victims/3 day optimum rescue = 225 225 victims/20 maximum = 11.25 Type I US&R Teams for 3 days 1350 victims trapped 50% trapped in LC (675) 675 victims/3 day optimum rescue = 225 225 victims/40 maximum = 5.6 Type I US&R Teams for 3 days
Type II Collapse Search and Rescue Team	Extrication of victims in 12 hrs: HC: Entombed: 1 Structurally trapped: 3	HC: 18 maximum rescued per 24 hours LC: 36 maximum	Requires 2 teams, each having one 12-hour operational period

Resource Organization	Estimated Capacity	Scenario Requirement Values	Quantity of Resources Needed
	Nonstructurally trapped: 5 LC: Entombed: 2 Structurally trapped: 6 Nonstructurally trapped: 10	rescued per 24 hours	
Type II Heavy Rescue Strike Team	Extrication of victims in 12 hrs: HC: Nonstructurally trapped: 6 LC: Structurally trapped: 6 Nonstructurally trapped: 9	HC: 12 maximum rescued per day LC: 30 maximum rescued per day	Requires 2 teams, each having one 12-hour operational period
Type II Heavy Rescue Squad	Extrication of victims in 12 hrs: LC: Structurally trapped: 2 Nonstructurally trapped: 3	LC: 10 maximum rescued per day	Requires 2 teams, each having one 12-hour operational period
Type I Large Animal Rescue Strike Team	This six-member team should be capable of completing an average of one rescue every 30 minutes in a suburban setting and one rescue every hour in rural settings. These times would be semi-dependent on uncontrollable factors such as terrain, weather, road conditions, and distance between rescue sites.		Number of teams ordered will be based on number of rescues anticipated.
Type I Small Animal Rescue Strike Team	This six-member team should be capable of completing an average of one rescue every 30 minutes in a suburban setting and one rescue every hour in rural settings. These times would be semi-dependent on uncontrollable factors such as terrain, weather, road conditions, and distance between rescue sites.		Number of teams ordered will be based on number of rescues anticipated.

Approaches for Large-Scale Events

- During incidents, licensing and certifications need to be national and not restricted by State borders. A border should not determine the location of a resource.
- Basic disaster training should be standard, such as that sanctioned by NIMS and the National Response Plan (NRP), to allow more personnel to be used on the day of the incident.

- Training must be coordinated at the Federal level.
- FEMA, in coordination with the Department of State (DOS), will coordinate the use and employment of international urban search and rescue assets/resources if the level of response will overwhelm our national capability.

Target Capability Preparedness Level

Resource Element Unit	Type of Element	Number of Units	Unit Measure (number per x)	Lead	Capability Activity supported by Element
Type I US&R Task Force (TF)	Resource Organization	1	Per each pre-determined location	Federal (DHS)	All SAR Activities
Type II Collapse Search and Rescue Team	Resource Organization	1	Per population > 100k	Local (City)	All SAR Activities
Type II Heavy Rescue Squad	Resource Organization	1	Per population >25k but <100k	Local (City)	All SAR Activities

References

1. Homeland Security Presidential Directive/HSPD-8, "National Preparedness". December 2003. <http://www.whitehouse.gov/news/releases/2003/12/20031217-6.html>
2. National Response Plan (NRP). Department of Homeland Security. December 2004.
3. National Incident Management System (NIMS). Department of Homeland Security. March 2004. <http://www.dhs.gov/interweb/assetlibrary/NIMS-90-web.pdf>
4. Homeland Security Exercise and Evaluation Program (HSEEP), Volume II: Exercise Evaluation and Improvement. Office for Domestic Preparedness, Department of Homeland Security. October 2003. <http://www.ojp.usdoj.gov/odp/docs/HSEEPv2.pdf>
5. Urban Search and Rescue (US&R) Incident Support Team (IST) In Federal Disaster Operations, Operations Manual. Federal Emergency Management Agency. January 2000. <http://www.fema.gov/pdf/usr/usristops.pdf>
6. National Urban Search and Rescue Response System Field Operations Guide. Federal Emergency Management Agency. September 2003. http://www.fema.gov/pdf/usr/usr_fog_sept_25_2003_color_final.pdf
7. National Urban Search and Rescue Response System Operations Manual: 2003-2004 Task Force Equipment Cache List. Federal Emergency Management Agency. August 2003. http://www.fema.gov/pdf/usr/task_force_documents equip_cach_list_intro.pdf
8. Urban Search and Rescue Task Force Equipment Cache List. Federal Emergency Management Agency. 2004. http://www.fema.gov/pdf/usr/usr_equip_cache_list.pdf
9. NFPA 1670- Standard on Operations and Training for Technical Search and Rescue Incidents. National Fire Protection Association. 2004 Edition. <http://www.nfpa.org/aboutthecodes/AboutTheCodes.asp?DocNum=1670>
10. NFPA 1006- Standard for Rescue Technician Professional Qualifications, National Fire Protection Association, 2003 Edition. <http://www.nfpa.org/aboutthecodes/AboutTheCodes.asp?DocNum=1006>
11. NFPA 1951- Standard on Protective Ensemble for US&R Operations, National Fire Protection Association, 2001 Edition. <http://www.nfpa.org/aboutthecodes/AboutTheCodes.asp?DocNum=1951>

12. NFPA 1500- Standard on Fire Department Occupational Safety and Health Program, National Fire Protection Association, 2002 Edition. <http://www.nfpa.org/aboutthecodes/AboutTheCodes.asp?DocNum=1500>
13. Inventory of Navy Laboratory Rescue & Diving Equipment Available for Emergency Undersea Operations, NOSC TD 112. U.S. Navy. 1983.
14. Rescue and Survival Systems Manual, COMDTINST M10470.10 (Series). U.S. Coast Guard. 2003.
15. SARSAT Users Manual for Use by Coast Guard Search and Rescue Personnel. U.S. Coast Guard, 1982.
16. Standard First Aid Training Course, NAVEDTRA 10081-C. U.S. Navy.
17. United States National Search and Rescue Supplement to the International Aeronautical and Maritime Search and Rescue Manual, National Search and Rescue Committee, Washington DC. May 2000.