

NFPA®

1006

Standard for
Technical Rescue Personnel
Professional Qualifications

2021



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NFPA® 1006

Standard for

Technical Rescue Personnel Professional Qualifications

2021 Edition

This edition of NFPA 1006, *Standard for Technical Rescue Personnel Professional Qualifications*, was prepared by the Technical Committee on Rescue Technician Professional Qualifications, released by the Correlating Committee on Professional Qualifications, and acted on by the NFPA membership during the 2020 NFPA Technical Meeting held June 8–29. It was issued by the Standards Council on August 11, 2020, with an effective date of August 31, 2020, and supersedes all previous editions.

This document has been amended by one or more Tentative Interim Amendments (TIAs) and/or Errata. See “Codes & Standards” at www.nfpa.org for more information.

This edition of NFPA 1006 was approved as an American National Standard on August 31, 2020.

Origin and Development of NFPA 1006

In 1994, the NFPA Standards Council, after receipt of a request for the development of a standard for the professional qualifications of rescue technicians, approved the establishment of a technical committee on Rescue Technician Professional Qualifications under the Professional Qualifications project. The committee developed the first edition of NFPA 1006, *Standard for Rescue Technician Professional Qualifications*, which established general job performance requirements (JPRs) for a rescue technician, as well as specific job performance requirements for special rescue operations. These performance requirements included rope rescue, surface water rescue, vehicle and machinery rescue, confined space rescue, structural collapse rescue, and trench rescue.

For the 2003 edition of NFPA 1006, all the chapters were reviewed and changes were made to comply with the *Manual of Style for NFPA Technical Committee Documents*. Three new chapters were added to the document: Subterranean Rescue, Dive Rescue, and Wilderness Rescue.

For the 2008 edition of NFPA 1006, the document was updated and chapters for Swiftwater Rescue, Ice Rescue, and Surf Rescue were added. The Subterranean Rescue chapter was broken into two chapters: one on Mine and Tunnel Rescue and the other on Cave Rescue.

Each chapter in the document was broken into two levels, Level I and Level II, and the document was retitled *Standard for Technical Rescuer Professional Qualifications*. Additional language was added to clarify the use of the standard.

The 2013 edition of NFPA 1006 was updated to recognize passive power sources and new and emerging technologies as challenges that create hazards to the technical rescuer. The goals for meeting these challenges and hazards were as follows:

- (1) To isolate and manage potentially harmful energy sources so that all hazards are identified, systems are managed, system use is evaluated, and hazards to rescue personnel are minimized
- (2) To identify types of energy sources, isolate system methods, recognize specialized features, ensure availability of proper tools and equipment, and ensure that operations support the tactical objective

Because of the new power sources in automobiles, Chapter 10 of the 2008 edition, Vehicle and Machinery Rescue, was separated into two chapters: Chapter 10, Vehicle Rescue, and Chapter 19, Machinery Rescue.

The simple-rope mechanical advantage system minimum travel distance for loads was modified based on the response area and the discipline-specific application. The distance traveled should reflect a typical distance experienced by a rescuer operating the equipment and performing the task.

Because of the nature and specific knowledge and skills required during a technical rescue incident, language was included in Chapter 1, Administration, that mandates a rescuer to remain current and “demonstrate competency on an annual basis.”

The prerequisite knowledge and skills found in Chapter 5 were clarified based on discipline-specific job performance requirements found in Chapters 6 through 19. The intent was to address all the applicable areas of Chapter 5 unless otherwise exempted in the discipline-specific chapters. In other words, each JPR should be addressed in a manner consistent with the discipline.

In Chapter 6, Rope Rescue, a specific reference to *highline system* was changed to *operation of a rope system* to broaden the definition to include other methods for moving a load horizontally.

Chapter 17, Mine and Tunnel Rescue, was modified and restructured to include Level I and Level II so that it complements the other disciplines within the document.

Annex material, including dive charts, air compression tables, and dive site diagrams, was upgraded. Annex E, Marking Systems, was updated to reflect similar references found in NFPA 1670, *Standard on Operations and Training for Technical Search and Rescue Incidents*.

In the 2017 edition, rescuer training levels were changed from Level I and II to Awareness, Operations, and Technician, which better align with NFPA 1670. JPRs were refined for all the positions within the scope of the standard. Chapters on Floodwater, Animal, Tower, Helicopter, and Watercraft Rescue were added. Definitions were updated and several were added to create consistency with NFPA 1670. In addition, the title of the standard was revised to be inclusive of all personnel associated with technical rescue.

For the 2021 edition, the committee reviewed the entire document to make necessary adjustments to the requirements so that they aligned better with NFPA 1670, as well as with other requirements in the document. The committee expanded on the vehicle rescue discipline by including a new chapter on common passenger vehicles and by renaming the existing *vehicle rescue* to *heavy vehicle rescue* given the vast differences between the two types of vehicles. The committee made numerous changes throughout the document to provide clarity to areas that previously might have been confusing, to strengthen the requirements to be qualified, and to take into account commonly accepted practices and include them in the requirements.

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Standard for

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2021 Edition

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Information on referenced and extracted publications can be found in Chapter 2 and Annex N.

Chapter 1 Administration

1.1* Scope. This standard identifies the minimum job performance requirements (JPRs) for technical rescue personnel.

1.2 Purpose. The purpose of this standard is to specify the minimum JPRs for service as technical rescue personnel.

1.2.1 This standard shall define technical rescue personnel.

1.2.2 The intent of this standard shall be to ensure that individuals serving as technical rescue personnel are qualified.

1.2.3* This standard shall not address organization or management responsibility.

1.2.4 It is not the intent of this standard to restrict any jurisdiction from exceeding or combining these minimum requirements.

1.2.5 JPRs for each level and position are the tasks personnel shall be able to perform to carry out the job duties.

Δ 1.2.6* Technical rescue personnel shall remain current with the general knowledge, skills, and JPRs addressed for each level or position of qualification.

N 1.2.7* Technical rescue personnel shall remain current with technical rescue practices and applicable standards and shall demonstrate competency on an annual basis.

N 1.2.8 Proficiency in current rescue practices shall be demonstrated by achieving certification and demonstrating skills and proficiencies through private, local, state, provincial, or federal programs providing an acceptable method approved by the AHJ.

1.3* Application. The application of this standard is to specify which requirements within the document shall apply to specific technical rescue personnel.

1.3.1* The JPRs shall be accomplished in accordance with the requirements of the authority having jurisdiction (AHJ) and all applicable NFPA standards.

1.3.2 It shall not be required that the JPRs be mastered in the order in which they appear. The AHJ shall establish instructional priority and the training program content to prepare personnel to meet the JPRs of this standard.

1.3.3* Performance of each requirement of this standard shall be evaluated by personnel approved by the AHJ.

1.3.4 The JPRs for each level or position shall be completed in accordance with recognized practices and procedures or as defined by law or by the AHJ.

N 1.3.5* All the chapters listed in Section 1.3.6 shall be utilized as stand-alone chapters for individual qualifications in specialty areas.

1.3.6 Prior to being qualified, personnel assigned to certain duties shall meet all the requirements of such duties as defined in the following chapters:

- (1) The duties of tower rescue are defined in Chapter 4.
- (2) The duties of rope rescue are defined in Chapter 5.
- (3) The duties of structural collapse rescue are defined in Chapter 6.
- (4) The duties of confined space rescue are defined in Chapter 7.
- (5) The duties of common passenger vehicle rescue are defined in Chapter 8.
- (6) The duties of heavy vehicle rescue are defined in Chapter 9.
- (7) The duties of animal rescue are defined in Chapter 10.
- (8) The duties of wilderness rescue are defined in Chapter 11.
- (9) The duties of trench rescue are defined in Chapter 12.
- (10) The duties of machinery rescue are defined in Chapter 13.
- (11) The duties of cave rescue are defined in Chapter 14.
- (12) The duties of mine and tunnel rescue are defined in Chapter 15.
- (13) The duties of helicopter rescue are defined in Chapter 16.
- (14) The duties of surface water rescue are defined in Chapter 17.
- (15) The duties of swiftwater rescue are defined in Chapter 18.
- (16) The duties of dive rescue are defined in Chapter 19.
- (17) The duties of ice rescue are defined in Chapter 20.

- (18) The duties of surf rescue are defined in Chapter 21.
- (19) The duties of watercraft rescue are defined in Chapter 22.
- (20) The duties of flood rescue are defined in Chapter 23.

1.3.7 The AHJ shall provide the personal protective clothing and equipment necessary to conduct assignments.

1.3.8 JPRs involving exposure to products of combustion shall be performed in approved PPE.

1.3.9* Prior to training to meet the requirements of this standard, personnel shall meet the following requirements:

- (1) Educational requirements established by the AHJ
- (2) Age requirements established by the AHJ
- (3) Medical requirements established by the AHJ
- (4) Job-related physical performance requirements established by the AHJ
- (5) Emergency medical care performance requirements for entry-level personnel developed and validated by the AHJ
- (6) Minimum requirements for hazardous materials incident and contact control training for entry-level personnel and validated by the AHJ
- (7) Psychological support/education requirements established by the AHJ

1.3.10 Wherever in this standard the terms *rules*, *regulations*, *policies*, *procedures*, *supplies*, *apparatus*, or *equipment* are referred to, it is implied that they are those of the AHJ.

1.3.11 Because technical rescue is hazardous and technical rescue personnel are required to perform rigorous activities in adverse conditions, regional and national safety standards shall be included in agency policies and procedures.

1.3.12 Technical rescue personnel shall complete all activities in the safest possible manner and shall follow national, federal, state, provincial, and local safety standards as they apply to technical personnel.

1.4 Units. In this standard, equivalent values in SI units shall not be considered as the requirement, as these values can be approximate. (See Table 1.4.)

Δ 1.5 Operational Levels. The AHJ shall establish written standard operating procedures (SOPs) consistent with one of the following operational levels for each of the disciplines defined in this document:

- (1)* *Awareness level.* This level represents the minimum capability of individuals who respond to technical search and rescue incidents.
- (2) *Operations level.* This level represents the capability of individuals to respond to technical search and rescue incidents and to identify hazards, use equipment, and apply limited techniques specified in this standard to support and participate in technical search and rescue incidents.

Table 1.4 U.S.-to-SI Conversions

Quantity	U.S. Unit/ Symbol	SI Unit/Symbol	Conversion Factor
Length	inch (in.)	millimeter (mm)	1 in. = 25.4 mm
	foot (ft)	meter (m)	1 ft = 0.305 m
Area	square foot (ft ²)	square meter (m ²)	1 ft ² = 0.0929 m ²

- (3) *Technician level.* This level represents the capability of individuals to respond to technical search and rescue incidents and to identify hazards, use equipment, and apply advanced techniques specified in this standard necessary to coordinate, perform, and supervise technical search and rescue incidents.

1.6* General.

1.6.1 Job performance requirements shall not be required to be mastered in the order in which they appear.

1.6.2 The AHJ shall be responsible for determining which disciplines are required to achieve the desired types of service and to provide training or certification as necessary to satisfy the service needs.

N 1.6.3 The AHJ shall make provisions for implementing search operations at a technical rescue incident to determine the presence of victim(s), their location, and their condition.

N 1.6.4 When multiple victims are present, the AHJ shall make provisions for prioritizing the rescue of victims based on their location, medical condition, and survival profile.

Chapter 2 Referenced Publications

2.1 General. The documents or portions thereof listed in this chapter are referenced within this standard and shall be considered part of the requirements of this document.

2.2 NFPA Publications. (Reserved) National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

2.3 Other Publications.

Merriam-Webster's Collegiate Dictionary, 11th edition, Merriam-Webster, Inc., Springfield, MA, 2003.

2.4 References for Extracts in Mandatory Sections.

NFPA 1, *Fire Code*, 2018 edition.

NFPA 402, *Guide for Aircraft Rescue and Fire-Fighting Operations*, 2019 edition.

NFPA 1000, *Standard for Fire Service Professional Qualifications Accreditation and Certification Systems*, 2017 edition.

NFPA 1002, *Standard for Fire Apparatus Driver/Operator Professional Qualifications*, 2017 edition.

NFPA 1500™, *Standard on Fire Department Occupational Safety, Health, and Wellness Program*, 2018 edition.

NFPA 1521, *Standard for Fire Department Safety Officer Professional Qualifications*, 2015 edition.

NFPA 1581, *Standard on Fire Department Infection Control Program*, 2015 edition.

NFPA 1620, *Standard for Pre-Incident Planning*, 2015 edition.

NFPA 1670, *Standard on Operations and Training for Technical Search and Rescue Incidents*, 2017 edition.

NFPA 1983, *Standard on Life Safety Rope and Equipment for Emergency Services*, 2017 edition.

Chapter 3 Definitions

3.1 General. The definitions contained in this chapter shall apply to the terms used in this standard. Where terms are not defined in this chapter or within another chapter, they shall be defined using their ordinarily accepted meanings within the context in which they are used. *Merriam-Webster's Collegiate*

Dictionary, 11th edition, shall be the source for the ordinarily accepted meaning.

3.2 NFPA Official Definitions.

3.2.1* Approved. Acceptable to the authority having jurisdiction.

3.2.2* Authority Having Jurisdiction (AHJ). An organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, an installation, or a procedure.

3.2.3 Labeled. Equipment or materials to which has been attached a label, symbol, or other identifying mark of an organization that is acceptable to the authority having jurisdiction and concerned with product evaluation, that maintains periodic inspection of production of labeled equipment or materials, and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

3.2.4* Listed. Equipment, materials, or services included in a list published by an organization that is acceptable to the authority having jurisdiction and concerned with evaluation of products or services, that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services, and whose listing states that either the equipment, material, or service meets appropriate designated standards or has been tested and found suitable for a specified purpose.

3.2.5 Shall. Indicates a mandatory requirement.

3.2.6 Should. Indicates a recommendation or that which is advised but not required.

3.2.7 Standard. An NFPA Standard, the main text of which contains only mandatory provisions using the word “shall” to indicate requirements and that is in a form generally suitable for mandatory reference by another standard or code or for adoption into law. Nonmandatory provisions are not to be considered a part of the requirements of a standard and shall be located in an appendix, annex, footnote, informational note, or other means as permitted in the NFPA Manuals of Style. When used in a generic sense, such as in the phrase “standards development process” or “standards development activities,” the term “standards” includes all NFPA Standards, including Codes, Standards, Recommended Practices, and Guides.

3.3 General Definitions.

3.3.1 Abrasion. The damaging effect on rope and other equipment caused by friction-like movement.

3.3.2 Access. See 3.3.30, Confined Space Approach.

3.3.3 Anchor Point. A single, structural component used either alone or in combination with other components to create an anchor system capable of sustaining the actual and potential load on the rope rescue system. [1670, 2017]

3.3.3.1 High-Point Anchor. A point above an obstacle to be negotiated used for attachment of rescue systems.

3.3.4 Anchor System. One or more anchor points rigged in such a way as to provide a structurally significant connection point for rope rescue system components. [1670, 2017]

3.3.4.1* Multiple-Point Anchor System. System configuration providing load distribution over more than one anchor point, either proportionally or disproportionately.

3.3.4.2* Single-Point Anchor System. An anchor system configuration utilizing a single anchor point to provide the primary support for the rope rescue system.

3.3.5 Ascending (Line). A means of safely traveling up a fixed line with the use of one or more ascent devices. [1670, 2017]

3.3.6 Ascending Device. An auxiliary equipment system component; a friction or mechanical device utilized to allow ascending a fixed line. [1983, 2017]

3.3.7 Atmospheric Monitoring. A method of evaluating the ambient atmosphere of a space, including but not limited to its oxygen content, flammability, and toxicity.

3.3.8* Basic First Aid Kit. Equipment or devices for managing infection exposure, airways, spinal immobilization, fracture immobilization, shock, and bleeding control.

3.3.9* Belay. The method by which a potential fall distance is controlled to minimize damage to equipment and/or injury to a live load. [1670, 2017]

3.3.10* Belay System. A nontensioned, manually operated system designed to belay a load.

3.3.11 Belayer. The rescuer who operates the belay system.

3.3.12 Belt. A system component; material configured as a device that fastens around the waist only and designated as a ladder belt, an escape belt, or a ladder/escape belt.

3.3.13 Benching or Benching System. A method of protecting employees from cave-ins by excavating the side of a trench or excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.

3.3.14 Beneficial System. Auxiliary-powered equipment in motor vehicles or machines that can enhance or facilitate rescues such as electric, pneumatic, or hydraulic seat positioners, door locks, window operating mechanisms, suspension systems, tilt steering wheels, convertible tops, or other devices or systems to facilitate the movement (extension, retraction, raising, lowering, conveyor control) of equipment or machinery.

3.3.15 Bight. The open loop in a rope or piece of webbing formed when it is doubled back on itself.

3.3.16* Bombproof. A term used to refer to a single anchor point capable of sustaining the actual or potential forces exerted on the rope rescue system without possibility of failure.

3.3.17 Breach. An opening made in the wall, floor, or ceiling of a structure, based on construction type, that can be used for moving rescuers, equipment, or victims into or out of the structure.

3.3.18 Breaching Techniques. Methods that utilize breaking and cutting tools to create safe openings in masonry, concrete, and wood structures.

3.3.19 Buoyancy Compensator Device (BCD). Device worn by a diver containing a bladder that is inflated or deflated by the diver to manage their buoyancy while immersed in a liquid.

3.3.20 Cave. A natural underground void formed by geologic process.

3.3.21 Cave-In. The separation of a mass of soil or rock material from the side of an excavation or trench, or the loss of soil from under a trench shield or support system, and its sudden movement into the excavation, either by falling or sliding, in sufficient quantity so that it could entrap, bury, or otherwise injure and immobilize a person. [1670, 2017]

3.3.22 Collapse Support Operations. Operations performed at the scene that include providing for rescuer comfort, scene lighting, scene management, and equipment readiness.

3.3.23 Collapse Type. Five general types of collapse include lean-to collapse, “V” shape collapse, pancake collapse, cantilever collapse, and A-frame collapse. (See Annex E.)

3.3.24 Collapse Zone. See 3.3.142, Rescue Area.

3.3.25 Common Passenger Vehicle. Light or medium duty passenger and commercial vehicles commonly encountered in the jurisdiction and presenting no unusual construction, occupancy, or operational characteristics to rescuers during an extrication event.

3.3.26 Communications Team. As related to caves, a specific combination of resources with a leader, personnel, and common equipment assembled for the purpose of establishing and maintaining communications between various locations in and out of the cave.

3.3.27* Community Resource List. A list that includes all private and public contact numbers that provide the available community resources to mitigate a specified type or range of rescue incidents and hazardous conditions in the community.

3.3.28 Competent Person. One who is capable of identifying existing and predictable hazards in the surroundings or working conditions that are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

3.3.29* Confined Space. An area large enough and so configured that a member can bodily enter and perform assigned work but which has limited or restricted means for access and egress and is not designed for continuous human occupancy. [1500, 2018]

3.3.30 Confined Space Approach. The means of approach to the entry opening of a confined space.

3.3.31 Confined Space Entry. Includes ensuing work activities in a confined space and is considered to have occurred as soon as any part of the entrant’s body breaks the plane of an opening into the space.

3.3.32 Confined Space Entry Opening. The port or opening used to enter a confined space.

3.3.33 Confined Space Entry Permit. A written or printed document established by an employer in applicable U.S. federally regulated industrial facilities for nonrescue entry into confined spaces, that authorizes specific employees to enter a confined space and contains specific information as required. (See Annex F.)

3.3.34* Confined Space Rescue Preplan. An informational document completed by rescue personnel pertaining to a specific space that should include, but is not limited to, information concerning hazard abatement requirements, access to the space, size and type of entry openings, internal configuration of the space, and a suggested action plan for rescue of persons injured within the space.

3.3.35 Confined Space Rescue Team. A combination of individuals trained, equipped, and available to respond to confined space emergencies. [1670, 2017]

3.3.36 Confined Space Retrieval Equipment. See 3.3.148, Retrieval Equipment (Retrieval System).

3.3.37* Confined Space Type. A classification of confined spaces that incorporates the size, configuration, and accessibility of an entry opening as well as the internal configuration/entanglement structures within the space.

3.3.38* Construction Type. Based on major construction categories, these categories include, but are not limited to, wood frame, steel, unreinforced masonry (URM), tilt-up; precast, high-rise, and formed in place.

3.3.39 Cribbing. Short lengths of timber/composite materials, usually 4 in. × 4 in. (101.60 mm × 101.60 mm) and 18 in. × 24 in. (457.20 mm × 609.60 mm) long that are used in various configurations to stabilize loads in place or while load is moving.

3.3.40 Critical Incident Stress Debriefing (CISD). A postincident meeting designed to assist rescue personnel in dealing with psychological trauma as the result of an emergency.

3.3.41 Critique. A postincident analysis of the effectiveness of the rescue effort.

3.3.42* Compartment Syndrome. A condition in which muscle death occurs because of pressure applied by an external load (e.g., a vehicle, parts of a fallen building, a rock, or a squeeze in a tight hole).

3.3.43 Cross Bracing. Lumber (generally 2 × 4 or 2 × 6 lumber) used to horizontally or diagonally heavier support struts (generally 4 × 4, 4 × 6, 6 × 6, or larger), usually by diagonally intersecting across struts needing support.

3.3.44* Cut Sheet. A document that specifies the dimensions, slope, and other pertinent information regarding a particular excavation.

3.3.45 Cut Station. A functional area that utilizes lumber, timber, and an assortment of hand and power tools to complete operational objectives for stabilizing or shoring at a rescue incident or training evolution.

3.3.46 Descending a Line. A means of traveling down a fixed line using a descent control device.

3.3.47 Descent Control Device. An auxiliary equipment item; a friction or mechanical device utilized with rope to control descent. [1983, 2017]

3.3.48 Dewatering Equipment. Electric- or fuel-powered pumps, hose, and appliances that are used in combination to remove water.

3.3.49 Dive. Exposure of an individual to a hyperbaric environment.

3.3.50* Dive Supervisor. The member of a dive team who has the authority and expertise to manage and direct all aspects of

the dive operation and has been trained to meet all nondiving job performance requirements of technician-level dive rescue.

3.3.51 Dive Team. A collection of divers and trained support personnel acting under the direction of a single team leader who are trained and equipped to act collectively to achieve a subsurface mission using a common set of practices or guidelines.

3.3.52* Dive Tender A member of the dive team responsible for assisting divers with assembly and donning of equipment, communicating with divers, tracking the diver's status and location, and managing subsurface search operations, and trained to meet all the job performance requirements of operations-level dive rescue.

3.3.53 Diver. An individual exposed to a hyperbaric environment while using a compressed gas or supplied breathing gas system.

3.3.53.1* 90 Percent Diver. A diver who is dressed, equipped, and positioned to quickly enter the water and assume the role of safety diver or otherwise assist the operation as necessary.

3.3.53.2* Safety Diver. A diver who is equipped and positioned to immediately submerge and lend assistance to a diver in distress or to engage in a search for a missing diver.

3.3.54 Dive Profile. Description and documentation of a diver's potential or actual exposure to a hyperbaric environment, which includes depth, duration of exposure, and, where applicable, intervals between exposures, which are intended to document and communicate the diver's nitrogen load.

3.3.55* Dive Tables. Tools used to calculate a diver's nitrogen loading based on depth, length of exposure to a hyperbaric environment, and intervals between exposures of an actual or a planned dive.

3.3.56 Double Block and Bleed. The closure of a line, duct, or pipe by closing, locking, and tagging two valves in line and opening, locking, and tagging a drain or vent valve in line between the two closed valves.

3.3.57 Downstream Safety. A trained swiftwater rescuer, located downstream of the entry point, who is ready to deploy a rescue device or perform a swiftwater rescue tactic to a victim or rescuer unable to self-extricate from a hazardous environment.

3.3.58 Dynamic Loads. Forces created by moving loads as well as those caused by the sudden cessation of that movement.

3.3.59 Edge Protection. A means of protecting software components within a rope rescue system from the potentially harmful effects of exposed sharp or abrasive edges. [1670, 2017]

3.3.60 Emergency. A fire, explosion, or hazardous condition that poses an immediate threat to the safety of life or damage to property. [1, 2018]

N 3.3.61 Emergency Escape Route. A preplanned and understood route that rescuers utilize to move to a safety zone or other low-risk area.

3.3.62 Emergency Medical Services. The treatment to patients, including first aid, cardiopulmonary resuscitation, basic life support, advanced life support, and other medical

protocols prior to arrival at a hospital or other health care facility. [1581, 2015]

3.3.63 Entry. The action by which a person passes into a confined space. Entry includes ensuing work or rescue activities in that environment and is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space, trench, or excavation. [1670, 2017] (See also 3.3.31, *Confined Space Entry*.)

3.3.64 Entry Opening. See 3.3.32, *Confined Space Entry Opening*.

3.3.65 Environmental Controls. See 3.3.22, *Collapse Support Operations*.

3.3.66 Excavation. Any man-made cut, cavity, trench, or depression in an earth surface, formed by the removal of earth. [1670, 2017]

3.3.67* Extinguishing Devices. Devices used to suppress fire, including, but not limited to, CO₂ extinguishers, dry chemical extinguishers, hose lines, and fire-fighting foam.

3.3.68* Face(s). The vertical or inclined earth surface formed as a result of excavation work. [1670, 2017]

3.3.69 Failure. The breakage, displacement, or permanent deformation of a structural member or connection so as to reduce its structural integrity and its supportive capabilities. [1670, 2017]

3.3.70 Fire Control Measures. Methods used to secure ignition sources at an incident scene that can include hose line placement and utilization of chemical agents to suppress fire potential.

3.3.71 Fixed Line System. A rope rescue system consisting of a nonmoving rope attached to an anchor system. [1670, 2017]

3.3.72 Flotation Aids. Devices that provide supplemental flotation for persons in the water but do not meet U.S. Coast Guard performance criteria such as breaking strength of the thread used in sewing the device, the usable life of the flotation materials including compressibility factors, the colors and fading potential of certain dyes used in the fabrication of the device, and the strength and breaking force required for buckles and tie straps.

3.3.73* General Area. An area surrounding the incident site, of which the size is proportional to the size and nature of the incident, and to which access by people, heavy machinery, and vehicles is limited and strictly controlled.

3.3.74 Hardware. Rigid mechanical auxiliary equipment that can include, but is not limited to, anchor plates, carabiners, and mechanical ascent and descent control devices. [1670, 2017]

3.3.75 Harness. See 3.3.96, *Life Safety Harness*.

3.3.76 Hasty Search. An initial deployment of search resources that involves a quick search of areas or segments likely to contain survivors. [1670, 2017]

3.3.77 Hazard Mitigation. Activities taken to isolate, eliminate, or reduce the degree of risk to life and property from hazards, either before, during, or after an incident.

3.3.78* Hazardous Atmospheres. Any atmosphere that can expose personnel to the risk of death, incapacitation, injury,

acute illness, or impairment of ability to self-rescue. [1670, 2017]

3.3.79 Hazardous Material. A substance or material that has been determined to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce, and which has been so designated.

3.3.80 Heavy Construction Type. Construction that utilizes masonry, steel, and concrete in various combinations, including, but not limited to, tilt-up, steel frame with infill, concrete moment resisting frame, concrete shear wall, unreinforced masonry infill in concrete frame, heavy floor, heavy wall, and precast concrete. (See Annex G.)

3.3.81* Heavy Equipment. Heavy-duty vehicles, specially designed for executing construction tasks, most frequently ones involving earthwork operations.

3.3.82 Heavy Object. An item of such size and weight that it cannot be moved without the use of power tools (e.g., hydraulic lifting devices) or mechanical advantage systems.

3.3.83* Heavy Vehicle. Heavy duty highway, off-road, construction, or mass transit vehicles constructed of materials presenting resistance to common extrication procedures, tactics, and resources and posing multiple concurrent hazards to rescuers from occupancy, cargo, size, construction, weight, or position.

3.3.84 High Angle. Refers to an environment in which the load is predominantly supported by the rope rescue system. [1670, 2017]

3.3.85 Highline System. A system of using rope or cable suspended between two points for movement of persons or equipment over an area that is a barrier to the rescue operation, including systems capable of movement between points of equal or unequal height.

3.3.86 Hitch. A knot that attaches to or wraps around an object so that when the object is removed, the knot will fall apart. [1670, 2017]

3.3.87 Incident Command System (ICS). A standardized on-scene emergency management construct specifically designed to provide for the adoption of an integrated organizational structure that reflects the complexity and demands of single or multiple incidents, without being hindered by jurisdictional boundaries. ICS is a combination of facilities, equipment, personnel, procedures, and communications operating within a common organizational structure, designed to aid in the management of resources during incidents. It is used for all kinds of emergencies and is applicable to small as well as large and complex incidents. ICS is used by various jurisdictions and functional agencies, both public and private, to organize field-level incident management operations.

3.3.88 Inclined Plane. A simple machine, a plane surface inclined to the horizon, or forming with a horizontal plane any angle but a right angle, creating mechanical advantage by distributing the work required to lift a load over a distance along an incline rather than straight up and down.

3.3.89* Isolation. The process by which an area is rendered safe through mitigation of dangerous energy forms.

3.3.90* Isolation System. An arrangement of devices, including isolation devices, applied with specific techniques, that

collectively serve to isolate a victim of a trench or excavation emergency from the surrounding product (e.g., soil, gravel, sand).

3.3.91 Job Performance Requirement (JPR). A written statement that describes a specific job task, lists the items necessary to complete the task, and defines measurable or observable outcomes and evaluation areas for the specific task. [1000, 2017]

3.3.92* Knot. A fastening made by tying together lengths of rope or webbing in a prescribed way.

3.3.93 Large Machinery. Complex machines (or machinery systems) constructed of heavy materials, not capable of simple disassembly, and presenting multiple concurrent hazards (e.g., control of energy sources, hazardous materials, change in elevation, multiple rescue disciplines, etc.), complex victim entrapment, or partial or complete amputation, and requiring the direct technical assistance of special experts in the design, maintenance, or construction of the device or machine.

3.3.94 Laser Target. A square or rectangular plastic device used in conjunction with a laser instrument to set the line and grade of pipe. [1670, 2017]

3.3.95 Levers. Tools that have a relationship of load/fulcrum/force to create mechanical advantage and move a load.

3.3.96 Life Safety Harness. An equipment item; an arrangement of materials secured about the body and used to support a person. [1983, 2017]

3.3.97 Life Safety Rope. See 3.3.153.2.

3.3.98 Lifting Tools. Hydraulic, pneumatic, mechanical, or manual tools that can lift heavy loads.

3.3.99 Light Frame Construction. Structures that have frame-work made out of wood or other lightweight materials. (See Annex G.)

3.3.100 Lip (Trench Lip). The area 2 ft horizontal and 2 ft vertical (0.61 m × 0.61 m) from the top edge of the trench face.

3.3.101 Lip Collapse. A collapse of the trench lip, usually subsequent to surcharge loading, impact damage from the excavating bucket, and/or inherent cohesive properties of the soil type.

3.3.102 Lip-In. See 3.3.101, Lip Collapse.

3.3.103 Litter. A transfer device designed to support and protect a victim during movement. [1670, 2017]

3.3.104 Litter Tender. A person who both accompanies and physically manages the litter. [1670, 2017]

3.3.105 Load (Mass). That which is being lowered, raised, or otherwise supported by a stabilization or rigging system.

3.3.106 Load Stabilization. The process of preventing a load from shifting in any direction.

3.3.107* Load Test. A method of preloading a rope rescue system to ensure all components are set properly to sustain the expected load.

3.3.108 Locating Devices. Devices utilized to locate victims in rescue incidents and structural components, including but not limited to voice, seismic, video, K-9, and fiber optic.

3.3.109 Low Angle. Refers to an environment in which the load is predominantly supported by itself and not the rope rescue system (e.g., flat land or mild sloping surface). [1670, 2017]

3.3.110* Lowering System. A rope rescue system used to lower a load under control. [1670, 2017]

3.3.111 Maintenance Kits. Items required for maintenance and inspection that include, but are not limited to, manufacturer product specifications; preventive maintenance checklists; periodic logbook records; inventory equipment lists; appropriate fluids, parts, and hardware; and testing instruments as required.

△ 3.3.112 Marking Systems. Various systems used to mark hazards, victim location, and pertinent structural information. (See Annex E.)

3.3.113 Mechanical Advantage (M/A). A force created through mechanical means including, but not limited to, a system of levers, gearing, or ropes and pulleys usually creating an output force greater than the input force and expressed in terms of a ratio of output force to input force. [1670, 2017]

3.3.114 Mechanical Advantage System.

3.3.114.1 Compound Rope Mechanical Advantage System. A combination of individual rope mechanical advantage systems created by stacking the load end of one rope mechanical advantage system onto the haul line of another or others to multiply the forces created by the individual system(s).

3.3.114.2* Simple Rope Mechanical Advantage System. A rope mechanical advantage system containing a single rope and one or more moving pulleys (or similar devices), all traveling at the same speed and in the same direction, attached directly or indirectly to the load mass, and might contain one or more stationary pulleys (or similar devices), so that the force on the system is distributed approximately evenly among its supporting rope segments.

3.3.115 Member. A person involved in performing the duties and responsibilities of an emergency response organization on a full-time or part-time basis, with or without compensation.

3.3.116* Minimum Primary Reserve Pressure. Minimum permissible breathing gas pressure remaining in a SCUBA diver's primary delivery system on reaching the surface and establishing positive buoyancy.

3.3.117 Nonintersecting Trench. See 3.3.206.2.

3.3.118 One-Call Utility Location Service. A service from which contractors, emergency service personnel, and others can obtain information on the location of underground utilities in any area. [1670, 2017]

N 3.3.119 Operator. An individual trained and responsible for the start-up, operation, and shutdown of the applicable equipment.

3.3.120 Packaging. The process of securing a victim in a transfer device, with regard to existing and potential injuries or illness, so as to prevent further harm during movement.

3.3.121 Parbuckling. A technique for moving a load utilizing a simple 2:1 mechanical advantage system in which the load is placed inside a bight formed in a length of rope, webbing,

tarpaulin, blanket, netting, and so forth that creates the mechanical advantage, rather than being attached to the outside of the bight with ancillary rope rescue hardware.

3.3.122 Patient Evacuation Team. As related to caves, a specific combination of resources with a leader, personnel, and common equipment assembled for the purpose of evacuating the patient from the cave.

3.3.123 Permit-Required Confined Space. See 3.3.33, Confined Space Entry Permit.

3.3.124 Personal Escape. See 3.3.161, Self-Rescue.

3.3.125* Personal Flotation Device (PFD). A device manufactured in accordance with U.S. Coast Guard specifications that provides supplemental flotation for persons in the water.

3.3.126* Personal Protective Equipment (PPE). The equipment provided to shield or isolate a person from the chemical, physical, or thermal hazards that can be encountered at a specific rescue incident.

3.3.127* Pneumatic Struts. Pneumatic or gas-filled tube and piston assemblies in vehicles or machinery.

N 3.3.128* Preclimb Checklist. A tool used in tower rescue as part of a rescue preplan that describes the conditions that must be met before rescuers climb the tower to perform a rescue operation and must continue to exist for sustained operation on the tower.

3.3.129 Pre-Entry Medical Exam. A baseline medical evaluation of the rescue entrants performed immediately prior to a rescue entry.

3.3.130* Pre-Incident Plan. A document developed by gathering general and detailed data that is used by responding personnel in effectively managing emergencies for the protection of occupants, responding personnel, property, and the environment. [1620, 2015]

3.3.131* Protective System. A method of protecting employees from cave-ins, from material that could fall or roll from an excavation face or into an excavation, or from the collapse of adjacent structures. [1670, 2017]

3.3.132 Public Safety Diving. Underwater diving, related to team operations and training, performed by any member, group, or agency of a community or government-recognized public safety diving or water rescue team. [1670, 2017]

3.3.133 Qualification. Having satisfactorily completed the requirements of the objectives.

3.3.134* Rapid Intervention Crew/Company (RIC). A minimum of two fully equipped personnel on site, in a ready state, for immediate rescue of disoriented, injured, lost, or trapped rescue personnel.

N 3.3.135* Rated Capacity. The working load limit permitted by the manufacturer under nominal working conditions.

3.3.136 Reach/Extension Device. Any device for water rescue that can be extended to a person in the water so that he or she can grasp it and be pulled to safety without physically contacting the rescuer.

3.3.137 Recovery. Nonemergency operations taken by responders to retrieve property or remains of victims.

3.3.138* Redundant Air System. A system composed of a compressed breathing gas source, pressure gauge, primary and secondary regulator, and a means of affixing the system to the diver so that it will not be dropped or dislodged; is completely independent of the diver's primary air system and is configured to be accessed without delay when the diver is under duress; and of sufficient capacity to permit the diver to ascend to the surface from the maximum recognized operational depth while complying with a prescribed ascent rate and any necessary safety stops.

3.3.139* Registered Professional Engineer. A person who is registered as a professional engineer in the state where the work is to be performed. [1670, 2017]

3.3.140 Requisite Equipment. Specific tools and equipment that are critical to performing a specific type of technical rescue.

3.3.141 Rescue. Activities directed at locating endangered persons at an emergency incident, removing those persons from danger, treating the injured, and providing for transport for the injured to an appropriate health care facility. [1670, 2017]

3.3.142 Rescue Area. Sometimes called the "hot," "danger," or "collapse" zone, an area surrounding the incident site (e.g., collapsed structure or trench) that has a size proportional to the hazards that exist.

3.3.143* Rescue Attendant. A rescue team member positioned outside the entrance of a confined space during a rescue incident who monitors the conditions in and immediately adjacent to the space, monitors rescue entrants, and performs rescue duties as assigned.

3.3.144* Rescue Entrant. A confined space rescue team member designated to enter confined spaces for rescue and who meets specified training requirements for each specific space he or she enters.

3.3.145 Rescue Incident. An emergency incident that primarily involves the rescue of persons subject to physical danger and that could include the provision of emergency medical care, but not necessarily. [1670, 2017]

3.3.146 Rescue Service. The rescue team designated for confined space rescue by the AHJ.

3.3.147* Rescue Team. A combination of rescue-trained individuals who are equipped and available to respond to and perform technical rescues.

3.3.148* Retrieval Equipment (Retrieval System). Combinations of rescue equipment used for nonentry (external) rescue of persons from confined spaces.

3.3.149 Rigging. The process of building a system to move or stabilize a load.

3.3.150 Rigging Systems. Systems used to move people or loads that can be configured with rope, wire rope, or cable and utilize different means, both mechanical and manual, to move the load.

3.3.151 Rigging Team. As related to caves, a specific combination of resources with a leader, personnel, and common equipment assembled for the purpose of rigging rope systems to negotiate obstacles to assist patient and rescuer movement in or out of the cave.

3.3.152 Risk/Benefit Analysis. A decision made by a responder based on a hazard identification and situation assessment that weighs the risks likely to be taken against the benefits to be gained for taking those risks. [1670, 2017]

3.3.153 Rope. A compact but flexible, torsionally balanced, continuous structure of fibers produced from strands that are twisted, plaited, or braided together, and that serve primarily to support a load or transmit a force from the point of origin to the point of application. (See also 3.3.153.2, *Life Safety Rope*.)

3.3.153.1* Large Animal. Domesticated livestock including, but not limited to, horses, cows, mules, donkeys, goats, llamas, alpacas, pigs, and exotic animals, such as zoo species, wildlife, and excluding household pets. [1670, 2017]

3.3.153.2 Life Safety Rope. Rope dedicated solely for the purpose of supporting people during rescue, fire fighting, other emergency operations, or during training evolutions. (See also 3.3.153, *Rope*.)

3.3.153.3* Lockout. A method for keeping equipment from being set in motion and endangering workers.

3.3.153.4 Water Rescue Rope. Rope that floats, has adequate strength for anticipated use, is not weakened to the point of inadequacy for the task by saturation or immersion in water, and is of sufficient diameter to be gripped by bare wet hands.

3.3.154 Rope Rescue Equipment. Components used to build rope rescue systems including life safety rope, life safety harnesses, and auxiliary equipment. [1670, 2017]

3.3.155 Rope Rescue System. A system comprised of rope rescue equipment and an appropriate anchor system intended for use in the rescue of a subject. [1670, 2017]

3.3.156 Scene Security. The means used to prevent or restrict entry to the scene of a rescue incident, either during or following the emergency.

3.3.157 SDS. Safety data sheets.

3.3.158 Screw Jack. Shoring system component made of sections of threaded bar stock that are incorporated with lengths of pipe or wood.

3.3.159* Secondary Collapse. A subsequent collapse in a building or excavation.

3.3.160 Security Measures. See 3.3.156, Scene Security.

3.3.161 Self-Rescue. Escaping or exiting a hazardous area under one's own power.

3.3.162 Sheeting and Shoring.

3.3.162.1 Supplemental Sheeting and Shoring. Sheeting and shoring operations that involve the use of commercial sheeting/shoring systems and/or isolation devices or that involve cutting and placement of sheeting and shoring when greater than 2 ft (0.61 m) of shoring exist below the bottom of the strongback. [1670, 2017]

3.3.162.2 Traditional Sheeting and Shoring. The use of 4 ft × 8 ft (1.22 m × 2.44 m) sheet panels, with a strongback attachment, supplemented by a variety of conventional shoring options such as hydraulic, screw, and/or pneumatic shores. [1670, 2017]

3.3.163 Sheet piling or Sheathing. A component of a shoring system with a large surface area supported by the uprights and cross-bracing of the shoring system that is used to retain the earth in position when loose or running soils are encountered.

3.3.164* Shield or Shield System. An engineered structure that is able to withstand the forces imposed on it by a cave-in and thereby protect persons within the structures.

3.3.165 Shore-Based Rescue. Any technique or procedure that provides a means for extracting a person from the water that does not require any member of the rescue team to leave the safety of the shore.

3.3.166 Shoring System. A system that supports unstable surfaces.

3.3.167 Shoring Team. The group of individuals, with established communications and leadership, assigned to construct, move, place, and manage the shoring or shoring system inside the space, trench, or excavation. [1670, 2017]

3.3.168 Sides. See 3.3.68, Face(s).

3.3.169* Signaling Device. Any resource that provides a distinct and predictable display, noise, or sensation that can be used to communicate a predetermined message or to attract the attention of other persons as desired by the initiator of the signal.

3.3.170 Size-Up. The ongoing observation and evaluation of factors that are used to develop strategic goals and tactical objectives.

3.3.171* Sloping System. A protecting system that uses inclined excavating to form sides that are inclined away from the excavation so as to prevent cave-in.

3.3.172 Slough-In. A type of collapse characterized by an interior portion of the trench wall spalling out and potentially leaving an overhanging ledge or void that needs to be filled.

3.3.173 Small Machine. Machinery or equipment capable of simple disassembly, or constructed of lightweight materials, presenting simple hazards, which are capable of being controlled by the rescuer(s).

3.3.174 Software (Rope Rescue). A flexible fabric component of rope rescue equipment that can include, but is not limited to, anchor straps, pick-off straps, and rigging slings. [1670, 2017]

3.3.175 Soldier Shoring or Skip Shoring. A shoring system that employs a series of uprights spaced at intervals with the exposed soil of the trench wall showing.

3.3.176 Spoil Pile (Spoil). A pile of excavated soil next to the excavation or trench.

3.3.177 Stabilization Points. Key points where stabilization devices can be installed on a vehicle or machine to keep the vehicle or object from moving during rescue operations.

3.3.178 Stabilization System. See 3.3.39, Cribbing.

3.3.179 Standard Operating Guideline. A written organizational directive that establishes or prescribes specific operational or administrative methods to be followed routinely, which can be varied due to operational need in the performance of designated operations or actions. [1521, 2015]

3.3.180 Static Loads. Forces applied within a system when the load is not moving.

3.3.181 Stemple. A man-made or natural beam or bar that, when wedged, serves as a removable anchor point.

3.3.182 Structural Load Calculations. Load calculations based on the weight per cubic foot of construction materials such as concrete, steel, and wood.

3.3.183 Structural Support System. See 3.3.166, Shoring System.

3.3.184 Strut. A compression element used in the support of structures, excavation openings, or other loads.

3.3.185 Superimposed Load. See 3.3.187, Surcharge Load.

3.3.186 Support System. A structure, such as underpinning, bracing, or shoring that provides support to an adjacent structure, underground installation, or the sides of an excavation. [1670, 2017]

3.3.187 Surcharge Load. Any weight in the proximity of the trench that increases instability or the likelihood of secondary cave-in.

3.3.188 Surface. A base that is secure and conducive to supporting and stabilizing a vehicle or object.

3.3.189 Surface Encumbrance. A natural or man-made structural object adjacent to or in the immediate vicinity of an excavation or trench.

3.3.190 Surface Water Rescue. Rescue of a victim who is afloat on the surface of a body of water.

3.3.191 Swiftwater. Water moving at a rate greater than one (1) knot [1.15 mph (1.85 km/hr)]. [1670, 2017]

3.3.192* System Safety Check. A method of evaluating the safe assembly of a rescue system.

3.3.193 Tabulated Data. Any set of site-specific design data used by a professional engineer to design a protective system at a particular location. [1670, 2017]

3.3.194 Task. A specific job behavior or activity. [1002, 2017]

3.3.195 Team. See 3.3.35, Confined Space Rescue Team.

3.3.196 Technical Rescuer. A person who is trained to perform or direct the technical rescue.

3.3.197 Technical Search and Rescue. The application of special knowledge, skills, and equipment to resolve unique and/or complex search and rescue situations.

3.3.198 Technical Search and Rescue Incident. Complex search and/or rescue incidents requiring specialized training of personnel and special equipment to complete the mission.

3.3.199 Throw Bag. A water rescue system that includes 50 ft to 75 ft (15.24 m to 22.86 m) of water rescue rope, an appropriately sized bag, and a closed-cell foam float.

3.3.200 Tide Tables. Schedule of predicted rise and fall of the surface of tidal waters above or below a mean water level at predictable times of each day of the year.

3.3.201 Toe. The point where the trench wall meets the floor of the trench.

3.3.202* Tool Kit. Equipment available to the rescuer as defined in this document.

3.3.203 Traffic Control. The direction or management of vehicle traffic such that scene safety is maintained and rescue operations can proceed without interruption.

3.3.204 Traffic Control Devices. Ancillary equipment/resources used at the rescue scene to facilitate traffic control such as flares, barricades, traffic cones, or barrier tape.

3.3.205 Transfer Device. Various devices, including litters and harnesses, used with rope rescue systems to package and allow safe removal of a subject from a specific rescue environment.

3.3.206 Trench/Trench Excavation. An excavation, narrow in relation to its length, made below the surface of the earth.

3.3.206.1* Intersecting Trench. A trench where multiple trench cuts or legs converge at a single point.

3.3.206.2 Nonintersecting Trench. A trench cut in a straight or nearly straight line with no crossing or converging trench legs or cuts.

3.3.207 Trench Box. See 3.3.164, Shield or Shield System.

3.3.208 Trench Floor. The bottom of the trench.

3.3.209 Trench Upright. A vertical support member that spans the distance between the toe of the trench and the trench lip to collect and distribute the force from the opposing wall over a large area.

3.3.210 Triage. The sorting of casualties at an emergency according to the nature and severity of their injuries. [402, 2019]

3.3.211 Upright. See 3.3.209, Trench Upright.

3.3.212 Upstream Spotter. An individual with proper alerting equipment tasked with providing notification of impending hazards or changes of conditions that could affect search and/or rescue operations downstream.

3.3.213 Victim Management. The manner of treatment given to those requiring rescue assistance.

3.3.214 Victim Removal System. Those systems used to move a victim to a safe location.

3.3.215 Wales. Also called walers or stringers; horizontal members of a shoring system placed parallel to the excavation face whose sides bear against the vertical members of a shoring system or earth.

3.3.216 Water Rescue Rope. See 3.3.153.4.

3.3.217 Waterborne Transportation Aid. A nonmotorized watercraft or rescue aid.

3.3.218 Water-bound Victim. A victim who is in the water needing assistance.

3.3.219* Watercraft. Manned vessels that are propelled across the surface of a body of water by means of oars, paddles, water jets, propellers, towlines, or air cushions and are used to transport personnel and equipment while keeping their occupants out of the water.

3.3.220* Watercraft Conveyance. Devices intended for the purpose of transporting, moving, lifting, or lowering watercraft

that might be required to be operated prior to and at the conclusion of every watercraft deployment.

3.3.221 Watermanship Skills. Capabilities that include swimming, surface diving, treading water, and staying afloat with a reasonable degree of comfort appropriate to the required task. [1670, 2017]

3.3.222 Wedges and Shims. Material used to tighten or adjust cribbing and shoring systems.

3.3.223 Wilderness. A setting in which the delivery of services including search, rescue, and patient care by response personnel is adversely affected by logistical complications, such as an environment that is physically stressful or hazardous to the patient, response personnel, or both; remoteness of the patient's location, such that it causes a delay in the delivery of care to the patient; anywhere the local infrastructure has been compromised enough to experience wilderness-type conditions, such as lack of adequate medical supplies, equipment, or transportation; remoteness from public infrastructure support services; poor to no medical services or potable water; compromised public safety buildings, public utilities or communications systems; city, county, state, provincial, tribal, or national recreational areas or parks with mountains, trails; areas they define as wilderness. [1670, 2017]

Chapter 4 Tower Rescue

4.1 Awareness Level. Prior to qualification at the awareness level in tower rescue, the individual shall meet the requirements defined in Section 4.1.

N 4.1.1* Perform the rescue of a person from a tower while working from ground ladders, aerial ladders, or other elevated devices employed by the AHJ, given an incident not requiring the rescuer to be solely supported by the tower, so that the patient is transferred from the tower to the elevated device, the agency's protocol for the use of the device is followed, and the risks to the victim and rescuer are minimized.

N (A) Requisite Knowledge. Familiarization with the use of ladders or elevated devices and specific procedures for using them in victim transfer from a tower.

N (B) Requisite Skills. Ability to work from or operate ladders or elevated devices capable of accessing and rescuing the tower victim and providing positive transfer from the tower to the aerial while providing fall protection for the victim and rescue personnel.

N 4.1.2 Size up a tower rescue incident, given background information and applicable reference materials, so that the scope of the rescue is determined, the number of victims is identified, the last reported location of all victims is established, witnesses and reporting parties are identified and interviewed, resource needs are assessed, primary search parameters are identified, and information required to develop an initial incident action plan is obtained.

N (A) Requisite Knowledge. Types of reference materials and their uses, availability and capability of the resources, elements of an incident action plan and related information, relationship of the size-up to the incident management system, and information gathering techniques and how that information is used in the size-up process, and basic search criteria for tower rescue incidents.

N (B) Requisite Skills. The ability to read technical rescue reference materials, gather information, use interview techniques, relay information, and use information-gathering sources.

N 4.1.3 Recognize incident hazards and initiate isolation procedures, given scene control barriers, personal protective equipment (PPE), requisite equipment, and available specialized resources, so that all hazards are identified; resource application fits the operational requirements; hazard isolation is considered; risks to rescuers, bystanders, and victims are minimized; and rescue time constraints are taken into account.

N (A) Requisite Knowledge. Resource capabilities and limitations; types and nature of incident hazards; equipment types and their use; isolation terminology, methods, equipment, and implementation; operational requirement concerns; common types of rescuer and victim risks; risk/benefit analysis methods and practices; hazard recognition, isolation methods, and terminology; methods for controlling access to the scene; and types of technical references.

N (B) Requisite Skills. The ability to identify resource capabilities and limitations, identify incident hazards, assess potential hazards to rescuers and bystanders, place scene control barriers, and operate control and mitigation equipment.

N 4.1.4 Recognize the need for technical rescue resources at an operations- or technical-level incident, given AHJ guidelines, so that the need for additional resources is identified, the response system is initiated, the scene is secured and rendered safe until additional resources arrive, and awareness-level personnel are incorporated into the operational plan.

N (A) Requisite Knowledge. Operational protocols, specific planning forms, types of incidents common to the AHJ, hazards, incident support operations and resources, and safety measures.

N (B) Requisite Skills. The ability to apply operational protocols, select specific planning forms based on the types of incidents, identify and evaluate various types of hazards within the AHJ, request support and resources, and determine the required safety measures.

N 4.1.5 Support an operations- or technician-level incident, given an incident, an assignment, an incident action plan, and resources from the tool kit, so that the assignment is carried out, progress is reported to command, environmental concerns are managed, personnel rehabilitation is facilitated, and the incident action plan is supported.

N (A) Requisite Knowledge. AHJ operational protocols, hazard recognition, incident management, PPE selection, resource selection and use, scene support requirements.

N (B) Requisite Skills. The ability to apply operational protocols, function within an incident management system, follow and implement an incident action plan, and report the task progress status to a supervisor or incident command.

Δ 4.2 Operations Level. The job performance requirements defined in Sections 4.1, 4.2, 5.2, 5.3.9, 5.3.10, and 5.3.11 shall be met prior to or during operations-level qualification in tower rescue.

4.2.1 Participate in a prerescue survey given a tower rescue preplan, the specific tower targeted in the preplan, an operations-level tower rescue tool kit, and a tower rescue team, so that the targeted elevation in the tower is attained using the

tools and techniques designated for use during a rescue operation, all elements of the rescue plan are implemented, and the full scope of the plan is exercised.

Δ (A) Requisite Knowledge. Tower preplan, contents, and use of the operations-level tower rescue tool kit and organizations' policies and procedures for operations tower rescue.

(B) Requisite Skills. Tower climbing to the designated height, selection, and transportation of designated tools.

4.2.2 Isolate and manage exposure to potentially harmful energy sources found in erected structures, including power systems such as mechanical, radio frequency (RF), and electrical hazards, given lock-out tag-out (LOTO) equipment and construction materials and PPE, so that all hazards are identified, systems are managed, beneficial system use is evaluated, and hazards to rescue personnel and victims are minimized.

(A) Requisite Knowledge. Types and uses of PPE, hazardous energy monitoring and testing equipment, types of energy sources, system isolation methods, specialized system features, tools for disabling hazards, and policies and procedures of the AHJ.

Δ (B) Requisite Skills. The ability to select and use hazard-specific PPE, monitor and test equipment, identify hazards, operate beneficial systems in support of tactical objectives, operate tools and devices for securing and disabling hazards, and engage in practices that minimize exposure to known or suspected hazards.

4.2.3 Assess the integrity of the tower structure and related components, given an incident, a preclimb checklist, and an unobstructed climb path so that safe access to the victim is assured, and ensure any integrated safety systems, such as vertical lifelines (e.g., cable or rail-type structure), are accessible.

Δ (A) Requisite Knowledge. Types of structures within area of response, including self-supported, lattice-type, guyed, monopole, or nonstandard-type towers and potential structural compromise that would create additional hazards to rescuers.

(B) Requisite Skills. Perform physical inspection of accessible tower components in accordance with a preclimb checklist.

4.2.4 Recognize, identify, and utilize typical fall protection and work positioning equipment used by climbers, given a specific tower structure, so that the victim can be transferred to the rescue system.

(A) Requisite Knowledge. Review tower rescue preplan to gain familiarity with tower climber safety and work positioning equipment.

(B) Requisite Skills. Operate tower climber safety and work positioning equipment.

4.2.5 Perform an ascent using proper PPE and safe climbing technique equipment, given an incident, so that access to the level of the victim is achieved.

(A) Requisite Knowledge. Determine proper PPE given the type of tower structure and integrated temporary or permanent safety systems to perform safe climbing techniques.

(B) Requisite Skills. Don appropriate PPE, including but not limited to fall protection, helmet, and gloves as appropriate, and use 100 percent tie off or vertical lifeline equipment systems ascend the tower structure.

4.2.6 Perform transfer between the ladder or climbing peg safety system, given an incident, so that tie off is maintained, equipment is utilized, and procedures are followed as part of identified rescue plan.

(A) Requisite Knowledge. Familiarity with the engagement and disengagement procedures from vertical lifeline cable or rope grabs and the use of Y-lanyard and work positioning lanyards.

(B) Requisite Skills. Perform safe transfer between integrated vertical lifeline systems and climb and maneuver on the tower structure while maintaining tie off.

4.2.7 Access a victim in a tower environment according to the rescue preplan, given an incident, so that the risks from a fall are minimized or eliminated, the patient is accessed, and the objective is achieved.

(A) Requisite Knowledge. Tactics identified in the rescue preplan. An understanding of fall factors and methods for reducing them for a rescuer performing tower climbing operations.

(B) Requisite Skills. The ability to implement the tactics and employ the tools identified in the preplan to achieve the objective.

4.2.8 Perform the removal of a victim from a preplanned tower environment, given an incident, a rescue preplan, and a prescribed means of removal of the victim to the objective, so that risks to victims and rescuers are minimized, all the elements of the preplan are complied with, and the objective is achieved.

(A) Requisite Knowledge. Tactics identified in the rescue preplan for the removal of a victim on a tower.

(B) Requisite Skills. Employ tactics identified in the rescue preplan for the removal of a victim on a tower.

4.2.9 Direct a team in removal of a victim from a preplanned tower environment, given an incident, a rescue preplan, and a prescribed means of removal of the victim to the objective, so that risks to victims and rescuers are minimized, all the elements of the preplan are complied with, and the objective is achieved.

(A) Requisite Knowledge. Tactics identified in the rescue preplan for the removal of a victim on a tower.

(B) Requisite Skills. Direct the employment of tactics identified in the rescue preplan for the removal of a victim on a tower.

4.2.10 Develop and adhere to contingency plans for when inclement weather or other factors make operations-level response ineffective or dangerous to rescuers, given an incident, so that a risk/benefit decision can be made.

(A) Requisite Knowledge. AHJ policies and procedures, risk versus benefit analysis application, site safety and hazard control techniques, and pre-incident rescue action planning.

Δ (B) Requisite Skills. Apply policies and protocols, risk versus benefit analysis information, and pre-incident planning data, risk management, and site safety control techniques.

4.2.11* Terminate an incident, given PPE specific to the incident, isolation barriers, and tool kit, so that rescuers and bystanders are protected and accounted for during termination

operations, the party responsible is notified of any modification or damage created during the operational period, documentation of loss or material use is accounted for, scene documentation is performed, scene control is transferred to a responsible party, potential or existing hazards are communicated to that responsible party, debriefing and postincident analysis and critique are considered, and command is terminated.

(A) Requisite Knowledge. PPE characteristics, hazard and risk identification, isolation techniques, statutory requirements identifying responsible parties, accountability system use, reporting methods, and postincident analysis techniques.

Δ (B) Requisite Skills. Selection and use of hazard-specific PPE, decontamination, barrier protection techniques, data collection and record-keeping/reporting protocols, and postincident analysis activities.

Δ 4.3 Technician Level. The job performance requirements defined in Sections 4.2 and 4.3 shall be met prior to or during technician-level qualification in tower rescue.

Δ 4.3.1 Direct a tower rescue team, given a tower rescue scenario, incident action plan, preincident plan data, and resources from the tower rescue tool kit, so that resources are deployed to best advantage, the incident action plan is supported, and objectives are attained.

(A) Requisite Knowledge. AHJ policies and procedures, incident management, site safety and hazard control techniques, and preplan usage.

(B) Requisite Skills. Interpret and apply policies and protocols, initiate and operate within the IMS, situational awareness, interpret and apply preincident planning data, risk management, and site safety control techniques.

Δ 4.3.2* Develop an incident action plan for a tower rescue incident on a structure whose size, shape, or configuration would accommodate only one rescuer, given a tower rescue scenario, so that a climbing path plan is established, hazardous energy sources are identified and managed, fall protection is maintained throughout the event, anchor points are identified and utilized to best advantage, and the incident action plan objectives are met.

(A) Requisite Knowledge. AHJ policies and procedures, data gathering and collection methods, climbing plan elements, anchor point identification and construction methods, hazardous energy source recognition, identification and control methods, free climb ascent and descent techniques, and fall protection methods.

(B) Requisite Skills. Size-up and assessment, hazard identification and control, identification and control of hazardous energy sources, use of monitoring equipment to detect hazardous energy sources, construction of anchor and belay systems, and selection of PPE and other resources from the tower rescue tool kit.

Δ 4.3.3* Ascend a simulated or actual tower to conduct a rescue, given an incident action plan and a preclimb checklist, so that the preclimb checklist and hazard control measures are implemented; fall protection systems are utilized; and the rescuer moves both horizontally and vertically between structural elements of the tower, with or without the benefit of climbing pegs, ladders, or vertical lifelines, to achieve the objectives of the incident action plan.

△ (A) **Requisite Knowledge.** Incident action plan, preclimb checklist, identification of site-specific tower features and components, type- and hazard-specific PPE selection, and climbing plan.

△ (B) **Requisite Skills.** Use of incident action plans, development and use of preclimbing checklists and site safety plans, types of fall protection and lifeline systems, tower anatomy and features, climbing techniques and methods.

△ 4.3.4 Perform a ground-based tower rescue requiring the rescue of a suspended victim from an elevated position, given an incident action plan, climbing plan, hazard-specific PPE, and resources from the tower rescue tool kit, so that the victim is released/transferred from an existing fall arrest system to one created by the rescuer, and the victim is moved both horizontally and vertically a distance representative of the rescue environment.

△ (A) **Requisite Knowledge.** Incident action plan, hazard and risk assessment, climbing plan elements, PPE selection and use, types of fall protection systems, fall protection system transfer procedures, and horizontal and vertical movement methods.

(B) **Requisite Skills.** Scene assessment, hazard control techniques, PPE use and application, fall protection system operation, horizontal and vertical climbing and movement techniques.

△ 4.3.5 Perform a rescue requiring the rescue of a victim suspended from a tower at a height beyond the scope of a ground-based rope rescue system, given an incident action plan, climbing plan, hazard-specific PPE, and resources from the tower rescue tool kit, so that the victim is transferred to the rescue system and is moved both horizontally and vertically a distance representative of the rescue environment.

△ (A) **Requisite Knowledge.** Incident action plan, hazard and risk assessment, climbing plan elements, PPE selection and use, types of fall protection systems, fall protection system transfer procedures, and horizontal and vertical movement methods.

△ (B) **Requisite Skills.** Scene assessment, hazard control techniques, PPE use and application, fall protection system operation, horizontal and vertical climbing and movement techniques, and tower-based rescue techniques.

N 4.3.6 Perform a lowering operation of a victim from a tower or elevated structure where the travel path or height of the objective requires establishment of multiple sets of sequential rope systems, given a tower rescue scenario and a tower rescue tool kit, so that the victim is protected from a fall, rope movement is managed without entanglement, and the objective is achieved.

N (A) **Requisite Knowledge.** Incident action plan, hazard and risk assessment, climbing plan elements, PPE selection and use, types of fall protection systems, fall protection system transfer procedures, and horizontal and vertical movement methods.

N (B) **Requisite Skills.** Scene assessment, hazard control techniques, PPE use and application, fall protection system operation, horizontal and vertical climbing and movement techniques, and multi-pitch tower-based rescue techniques.

Chapter 5 Rope Rescue

5.1 **Awareness Level.** Prior to qualification at the awareness level in rope rescue, the individual shall meet the requirements defined in Section 5.1.

5.1.1 Assist a team in operation of the haul line of a rope mechanical advantage system raising operation, given rescue personnel, an established rope rescue system, a load to be moved, and an anchor system, so that the movement is controlled; a reset is accomplished; the load can be held in place when needed; commands are followed in direction of the operation; and potential problems are identified, communicated, and managed.

(A) **Requisite Knowledge.** Principles of mechanical advantage, operation of a haul line in a raising operation, personnel assignments, and operational commands.

(B) **Requisite Skills.** The ability to recognize operational commands and identify safety concerns during raising operations.

• N 5.1.2 Size up a rope rescue incident, given background information and applicable reference materials, so that the scope of the rescue is determined, the number of victims is identified, the last reported location of all the victims is established, witnesses and reporting parties are identified and interviewed, resource needs are assessed, primary search parameters are identified, and information required to develop an initial incident action plan is obtained.

N (A) **Requisite Knowledge.** Types of reference materials and their uses, availability and capability of the resources, elements of an incident action plan and related information, relationship of the size-up to the incident management system, information gathering techniques and how that information is used in the size-up process, and basic search criteria for rope rescue incidents.

N (B) **Requisite Skills.** The ability to read technical rescue reference materials, gather information, use interview techniques, relay information, and use information-gathering sources.

N 5.1.3 Recognize incident hazards and initiate isolation procedures, given scene control barriers, personal protective equipment (PPE), requisite equipment, and available specialized resources, so that all hazards are identified; resource application fits the operational requirements; hazard isolation is considered; risks to rescuers, bystanders, and victims are minimized; and rescue time constraints are taken into account.

N (A) **Requisite Knowledge.** Resource capabilities and limitations; types and nature of incident hazards; equipment types and their use; isolation terminology, methods, equipment, and implementation; operational requirement concerns; common types of rescuer and victim risks; risk/benefit analysis methods and practices; hazard recognition, isolation methods, and terminology; methods for controlling access to the scene; and types of technical references.

N (B) **Requisite Skills.** The ability to identify resource capabilities and limitations, identify incident hazards, assess potential hazards to rescuers and bystanders, place scene control barriers, and operate control and mitigation equipment.

N 5.1.4 Recognize the need for technical rescue resources at an operations- or technician-level incident, given AHJ guidelines, so that the need for additional resources is identified, the

response system is initiated, the scene is secured and rendered safe until additional resources arrive, and awareness-level personnel are incorporated into the operational plan.

(A) Requisite Knowledge. Operational protocols, specific planning forms, types of incidents common to the AHJ, hazards, incident support operations and resources, and safety measures.

(B) Requisite Skills. The ability to apply operational protocols, select specific planning forms based on the types of incidents, identify and evaluate various types of hazards within the AHJ, request support and resources, and determine the required safety measures.

5.1.5 Support an operations- or technician-level incident, given an incident, an assignment, an incident action plan, and resources from the tool kit, so that the assignment is carried out, progress is reported to command, environmental concerns are managed, personnel rehabilitation is facilitated, and the incident action plan is supported.

(A) Requisite Knowledge. AHJ operational protocols, hazard recognition, incident management, PPE selection, resource selection and use, and scene support requirements.

(B) Requisite Skills. The ability to apply operational protocols, function within an incident management system, follow and implement an incident action plan, and report the task progress status to a supervisor or incident command.

5.2 Operations Level. The job performance requirements defined in Sections 5.1 and 5.2 shall be met prior to or during operations-level qualification in rope rescue.

5.2.1 Perform size up of a rescue incident, given background information and applicable reference materials, so that the type of rescue is determined, the number of victims is identified, the last reported location of all victims is established, witnesses and reporting parties are identified and interviewed, resource needs are assessed, search parameters are identified, and information required to develop an incident action plan is obtained.

(A) Requisite Knowledge. Types of reference materials and their uses, availability and capability of the resources, elements of an action plan and related information, relationship of size-up to the incident management system, and information gathering techniques and how that information is used in the size-up process.

(B) Requisite Skills. The ability to read technical rescue reference materials, gather information, relay information, and use information gathering sources.

5.2.2* Maintain hazard-specific PPE, given clothing or equipment for the protection of the rescuers, inspection procedures, cleaning and sanitation supplies, maintenance logs or records, and such tools and resources as are indicated by the manufacturer's guidelines for assembly or disassembly of components during repair or maintenance, so that damage, defects, and wear are identified and reported or repaired, equipment functions as designed, and preventive maintenance has been performed and documented consistent with the manufacturer's recommendations.

(A) Requisite Knowledge. Functions, construction, and operation of PPE; use of record-keeping systems of the AHJ; requirements and procedures for cleaning, sanitizing, and infectious

disease control; use of provided assembly and disassembly tools; manufacturer and department recommendations; pre-use inspection procedures; and ways to determine operational readiness.

(B) Requisite Skills. The ability to identify wear and damage indicators for PPE; evaluate operational readiness of PPE; complete logs and records; use cleaning equipment, supplies, and reference materials; and select and use tools specific to the task.

5.2.3* Maintain rescue equipment, given maintenance logs and records, tools, and resources as indicated by the manufacturer's guidelines, inspection procedures, equipment replacement protocol, and organizational standard operating procedure, so that the operational status of equipment is verified and documented, all components are checked for operation, deficiencies are repaired or reported as indicated by standard operating procedure, and items subject to replacement protocol are correctly disposed of and changed.

(A) Requisite Knowledge. Functions and operations of rescue equipment, use of record-keeping systems, manufacturer and organizational care and maintenance requirements, selection and use of maintenance tools, replacement protocol and procedures, disposal methods, and organizational standard operating procedures.

(B) Requisite Skills. The ability to identify wear and damage indicators for rescue equipment, evaluate operation readiness of equipment, complete logs and records, and select and use maintenance tools.

5.2.4* Demonstrate knots, bends, and hitches, given ropes, webbing, and a list of knots used by the agency, so that the knots are dressed, recognizable, and backed up as required.

(A) Requisite Knowledge. Knot efficiency, knot utilization, rope construction, and rope terminology.

(B) Requisite Skills. The ability to tie representative knots, bends, or hitches for the following purposes:

- (1) End-of-line loop
- (2) Midline loop
- (3) Securing rope around desired objects
- (4) Joining rope or webbing ends together
- (5) Gripping rope

5.2.5 Construct a single-point anchor system, given life safety rope and other auxiliary rope rescue equipment, so that the chosen anchor system fits the incident needs, meets or exceeds the expected load, and does not interfere with rescue operations, an efficient anchor point is chosen, the need for redundant anchor points is assessed and used as required, the anchor system is inspected and loaded prior to being placed into service, and the integrity of the system is maintained throughout the operation.

(A) Requisite Knowledge. Application of knots, rigging principles, anchor selection criteria, system safety check procedures, rope construction, and rope rescue equipment applications and limitations.

(B) Requisite Skills. The ability to select rope and equipment; tie knots; rig systems; evaluate anchor points for required strength, location, and surface contour; and perform a system safety check.

5.2.6 Construct a multiple-point anchor system, given life safety rope and other auxiliary rope rescue equipment, so that the chosen anchor system fits the incident needs, the system strength meets or exceeds the expected load and does not interfere with rescue operations, equipment is visually inspected prior to being put in service, the most appropriate anchor points are chosen, the anchor system is system safety checked prior to being placed into service, the integrity of the system is maintained throughout the operation, and the force will be distributed — proportionally or disproportionally — between more than one anchor point.

(A)* Requisite Knowledge. Relationship of angles to forces created in the rigging of multiple-point anchor systems, safety issues in choosing anchor points, system safety check methods that allow for visual and physical assessment of system components, methods to evaluate the system during operations, integrity concerns, weight distribution issues and methods, knots and applications, selection and inspection criteria for hardware and software, formulas needed to calculate safety factors for load distribution, and the concepts of static loads versus dynamic loads.

(B) Requisite Skills. The ability to determine incident needs as related to choosing anchor systems, select effective knots, determine expected loads, evaluate incident operations as related to interference concerns and setup, choose anchor points, perform a system safety check, and evaluate system components for compromised integrity.

5.2.7 Conduct a system safety check, given a rope rescue system and rescue personnel, so that a physical/visual check of the system is made to ensure proper rigging, a load test is performed prior to life-loading the system, and verbal confirmation of these actions is announced and acknowledged before life-loading the rope rescue system.

(A) Requisite Knowledge. System safety check procedures, construction and operation of rope rescue systems and their individual components, use of PPE, equipment inspection criteria, signs of equipment damage, principles of rigging, and equipment replacement criteria.

(B) Requisite Skills. The ability to apply and use PPE, inspect rope rescue system components for damage, assess a rope rescue system for configuration, secure equipment components, inspect all rigging, and perform a system safety check.

5.2.8 Place edge protection, given life safety rope or webbing traversing a sharp or abrasive edge, edge protection, and other auxiliary rope rescue equipment, so that the rope or webbing is protected from abrasion or cutting, the rescuer is safe from falling while placing the edge protection, the edge protection is secure, and the rope or webbing is securely placed on the edge protection.

(A) Requisite Knowledge. Materials and devices that can be used to protect ropes or webbing from sharp or abrasive edges, fall protection measures, dangers associated with sharp or abrasive edges, and methods for negotiation of sharp or abrasive edges.

(B) Requisite Skills. The ability to select protective devices for rope and webbing, protect personnel from falls while working near edges, secure edge protection, and secure ropes or webbing in a specific location.

5.2.9* Construct a system intended to provide belay within a single- or two-tensioned rope system, given life safety rope, anchor systems, PPE, and rope rescue equipment, so that the system is capable of arresting a fall, a fall will not result in system failure, the system is not loaded unless actuated, actuation of the system will not injure or otherwise incapacitate the belay operator, the belay operator is not rigged into the equipment components of the system, and the system is suitable to the site and is connected to an anchor system and the load.

(A) Requisite Knowledge. Principles of belay systems, capabilities and limitations of various devices used to provide belay, application of knots, rigging principles, and system safety check procedures.

(B) Requisite Skills. The ability to select a system, tie knots, perform rigging, attach to anchor system and load, don and use hazard-specific PPE, and perform a system safety check.

Δ **5.2.10** Operate a system intended to provide belay within a single- or two-tensioned rope system during a lowering or raising operation, given an operating lowering or raising mechanical advantage system, a specified minimum travel distance for the load, a system, and a load, so that the potential fall factor is minimized, the belay is not actuated during normal lowering and raising operations, the belay system is prepared for actuation at all times during the operation, the belay operator is attentive at all times during the operation, the load's position is continually monitored, and the belay operator moves rope through the belay device as designed.

Δ **(A) Requisite Knowledge.** Application and use of belay devices, proper operation of systems in conjunction with normal lowering and raising operations, and operational commands.

(B) Requisite Skills. The ability to tend a belay device as designed, tie approved knots, assess system effectiveness, properly attach a rope to a belay device, don and use hazard-specific PPE, perform a system safety check, and manage and communicate belay system status effectively.

Δ **5.2.11*** Belay a falling load in a high-angle environment, given a belay and a failed line creating a dropped load, so that the belay line is not taut until the load is falling, the belay device is actuated when the load falls, the fall is arrested in a manner that minimizes the force transmitted to the load, the belay operator utilizes the belay device as designed, and the belay operator is not injured or otherwise incapacitated during actuation of the belay system.

(A) Requisite Knowledge. Application and use of belay devices, effective emergency operation of belay devices to arrest falls, use of PPE, and operating procedures.

(B) Requisite Skills. The ability to operate a belay system as designed, tie approved knots, use hazard-specific PPE, recognize and arrest a falling load, and communicate belay system actuation.

5.2.12 Construct a fixed rope system, given an anchor system, a life safety rope, and rope rescue equipment, so that the system constructed can accommodate the load, is efficient, and is connected to an anchor system and the load, and a system safety check is performed and the results meet the incident requirements for descending or ascending operations.

(A) Requisite Knowledge. Knot selection, calculating expected loads, incident evaluation operations as related to interference concerns and setup, rigging principles, system safety

check procedures, and methods of evaluating system components for compromised integrity.

(B) Requisite Skills. The ability to select effective knots, calculate expected loads, use rigging principles, evaluate incident operations as related to interference concerns and setup, perform a system safety check, and evaluate system components for compromised integrity.

5.2.13 Construct a lowering system, given an anchor system, life safety rope(s), descent control device, and auxiliary rope rescue equipment, so that the system can accommodate the load, is efficient, is capable of controlling the descent, is capable of holding the load in place or lowering with minimal effort over the required distance, and is connected to an anchor system and the load.

(A) Requisite Knowledge. Capabilities and limitations of various descent control devices, capabilities and limitations of various lowering systems, application of knots, rigging principles, and system safety check procedures.

(B) Requisite Skills. The ability to tie knots; perform rigging; attach to descent control device, anchor system, and load; and perform a system safety check.

5.2.14* Direct a lowering operation in a high-angle environment, given rescue personnel, an established lowering system, a specified minimum travel distance for the load, and a load to be moved, so that the movement is controlled, the load can be held in place when needed, operating methods do not stress the system to the point of failure, rope commands are used to direct the operation, and potential problems are identified, communicated, and managed.

(A) Requisite Knowledge. Application and use of descent control devices, capabilities and limitations of various lowering systems in a high-angle environment, operation of lowering systems in a high-angle environment, personnel assignments, and operational commands.

(B) Requisite Skills. The ability to direct personnel, use operational commands, analyze system efficiency, manage movement of the load in a high-angle environment, identify safety concerns in a high-angle environment, and perform a system safety check.

5.2.15 Construct a simple rope mechanical advantage system, given life safety rope, carabiners, pulleys, rope grab devices, and auxiliary rope rescue equipment, so that the system constructed can accommodate the load, is efficient, and is connected to an anchor system and the load.

(A) Requisite Knowledge. Principles of mechanical advantage, capabilities and limitations of various simple rope mechanical advantage systems, application of knots, rigging principles, and system safety check procedures.

(B) Requisite Skills. The ability to select rope and equipment, tie knots, choose and rig systems, attach the mechanical advantage system to the anchor system and load, and perform a system safety check.

5.2.16* Direct a team in the operation of a simple rope mechanical advantage system in a high-angle raising operation, given rescue personnel, an established rope rescue system incorporating a simple rope mechanical advantage system, a specified minimum travel distance for the load, a load to be moved, and an anchor system, so that the movement is controlled,

a reset is accomplished, the load can be held in place when needed, operating methods do not stress the system to the point of failure, commands are used to direct the operation, and potential problems are identified, communicated, and managed.

(A) Requisite Knowledge. Principles of mechanical advantage, capabilities and limitations of various simple rope mechanical advantage systems and high-angle raising operations, correct operation of simple rope mechanical advantage systems, personnel assignments, and operational commands.

(B) Requisite Skills. The ability to direct personnel effectively, use operational commands, analyze system efficiency, identify safety concerns, and perform a system safety check.

5.2.17 Construct a compound rope mechanical advantage system, given a load, an anchor system, life safety rope, carabiners, pulleys, rope grab devices, and rope rescue equipment, so that the system constructed accommodates the load and reduces the force required to lift the load, operational interference is factored and minimized, the system is efficient, a system safety check is completed, and the system is connected to an anchor system and the load.

(A) Requisite Knowledge. Determination of incident needs as related to choosing compound rope systems, the elements of efficient design for compound rope systems, knot selection, methods for reducing excessive force to system components, evaluation of incident operations as related to interference concerns and setups, rope commands, rigging principles, system safety check procedures, and methods of evaluating system components for compromised integrity.

(B) Requisite Skills. The ability to determine incident needs as related to choosing compound rope systems, select effective knots, calculate expected loads, evaluate incident operations as related to interference concerns and setups, perform a system safety check, and evaluate system components for compromised integrity.

5.2.18* Direct the operation of a compound rope mechanical advantage system in a high-angle environment, given a rope rescue system incorporating a compound rope mechanical advantage system and a load to be moved, and a specified minimum travel distance for the load, so that a system safety check is performed; a reset is accomplished, and the movement is controlled; the load can be held in place when needed; operating methods do not stress the system to the point of failure; operational commands are clearly communicated; and potential problems are identified, communicated, and managed.

Δ (A) Requisite Knowledge. Methods to determine incident needs, types of interference concerns, rope commands, system safety check protocol, procedures for continued evaluation of system components for compromised integrity, common personnel assignments and duties, common commands, methods for controlling a load's movement, system stress issues during operations, and management methods for common problems.

(B) Requisite Skills. The ability to determine incident needs, evaluate incident operations as related to interference concerns, complete a system safety check, continually evaluate system components for compromised integrity, direct personnel effectively, communicate commands, analyze system efficiency, manage load movement, and identify concerns.

5.2.19 Negotiate an edge while attached to a rope rescue system during a high-angle lowering and raising operation, given a rope rescue system, a specified minimum travel distance for the rescuer, life safety harnesses, an edge to negotiate during the lower and raise, and specialized equipment necessary for the environment, so that risk to the rescuer is minimized; the means of attachment to the rope rescue system is secure; and all projections and edges are negotiated while minimizing risks to the rescuer or equipment.

(A) Requisite Knowledge. Techniques and practices for negotiating existing projections and edges along the travel path while suspended from operating rope-based lowering and raising mechanical advantage systems and common hazards imposed by those projections and edges.

(B) Requisite Skills. The ability to select and use rescuer harness and PPE for common environments, attach the life safety harness to the rope rescue system, maneuver across existing projections and an edge along the travel path, and evaluate surroundings for potential hazards.

Δ **5.2.20** Prepare for transfer of victims, given diagnostic and packaging equipment and an actual or simulated EMS agency, so that rescuers and victims are protected from hazards, victim injuries or illnesses are managed, and victims are delivered to the EMS provider with information regarding the history of the rescue activity and victim conditions.

(A) Requisite Knowledge. Victim and scene assessment methods; victim treatment, immobilization, and packaging methods; and medical information management and communication methods.

(B) Requisite Skills. The ability to use victim immobilization, packaging, and treatment methods appropriate to the situation and provide victim transfer reports, both verbally and in written format.

5.2.21 Direct a litter-lowering and litter-raising operation in a low-angle environment, given rescue personnel, litter tender(s), an established lowering/mechanical advantage system, a specified minimum travel distance for the load and a victim packaged in a litter to be moved, so that the litter is attached to the lowering/raising and belay systems, movement is controlled; litter tender(s) are used to manage the litter during the lower and raise, the litter can be held in place when needed; operating methods do not stress the system to the point of failure; rope commands are used to direct the operation; and potential problems are identified, communicated, and managed.

(A) Requisite Knowledge. Application and use of lowering and mechanical advantage system in the low-angle environment, capabilities and limitations of various lowering and mechanical advantage systems in a low-angle environment, litter tender functions and limitations in the low-angle environment, management of a litter in a low-angle environment during raises and lowers, personnel assignments, and operational commands.

(B) Requisite Skills. The ability to direct personnel, use operational commands, analyze system efficiency, manage movement of the litter in a high-angle environment, identify safety concerns in a low-angle litter operation, and perform a system safety check.

5.2.22* Operate as a litter tender in a low-angle lowering or raising operation, given a rope rescue system, a specified minimum travel distance for the litter tender, life safety harnesses, litters, bridles, and specialized equipment necessary for the environment, so that risks to victims and rescuers are minimized; the means of attachment to the rope rescue system is secure; and the terrain is negotiated while minimizing risks to equipment or persons.

(A) Requisite Knowledge. Task-specific selection criteria for life safety harnesses, PPE selection criteria, variations in litter design and intended purpose, low-angle litter attachment principles, techniques and practices for low-angle environments, and common hazards imposed by the terrain.

(B) Requisite Skills. The ability to select and use rescuer harness and PPE for common environments, attach the life safety harness to the rope rescue system, maneuver across the terrain, manage the litter while suspended from the rope rescue system, and evaluate surroundings for potential hazards.

5.2.23* Direct a litter-lowering or litter-raising operation in a high-angle environment, given rescue personnel, an established lowering/mechanical advantage system, a specified minimum travel distance for the load, a victim packaged in a litter to be moved, and a means for negotiating edges and projections along the travel path, so that the litter is attached to the lowering/raising and belay systems, an edge is negotiated during a lower and raise; tag lines are used to manage the litter during the lower and raise; the litter can be held in place when needed; operating methods do not stress the system to the point of failure; rope commands are used to direct the operation; and potential problems are identified, communicated, and managed.

(A) Requisite Knowledge. Application and use of lowering and mechanical advantage system in the high-angle environment, capabilities and limitations of various lowering and mechanical advantage systems in a high-angle environment, use of tag lines for management of litter position during high-angle lowers and raises, personnel assignments, and operational commands.

(B) Requisite Skills. The ability to direct personnel, use operational commands, analyze system efficiency, manage movement of the litter in a high-angle environment, identify safety concerns in a high-angle environment, and perform a system safety check.

5.2.24* Terminate a technical rescue operation, given an incident scenario, assigned resources, and site safety data, so that rescuer risk and site safety are managed, scene security is maintained and custody transferred to a responsible party, personnel and resources are returned to a state of readiness, record keeping and documentation occur, and post event analysis is conducted.

(A) Requisite Knowledge. Incident Command functions and resources, hazard identification and risk management strategies, logistics and resource management, personnel accountability systems, and AHJ-specific procedures or protocols related to personnel rehab.

(B) Requisite Skills. Hazard recognition, risk analysis, use of site control equipment and methods, use of data collection and management systems, and use of asset and personnel tracking systems.

Δ 5.3 Technician Level. The job performance requirements defined in Sections 5.2 and 5.3 shall be met prior to or during technician-level qualification in rope rescue.

5.3.1 Direct a team in the operation of a rope rescue system to remove a victim stranded on or clinging to a natural or manmade feature in a high-angle environment, given a victim stranded on or clinging to a feature and a means of removal of the victim to the ground or other safe area, so that risks to victims and rescuers are minimized, injury to the victim is minimized, the means of attachment to the rope rescue system is maintained, the victim is removed and brought to a safe area for transfer to EMS.

(A) Requisite Knowledge. Techniques and systems for safe transfer of stranded victims from a natural or man feature, various techniques for handling stranded victims without inducing a fall.

(B) Requisite Skills. Select and construct systems for rapid removal of stranded victims from natural or manmade features, manage operation of the selected system, determine condition of the stranded victim, reduce hazards for rescuers and victims, and determine specialized equipment needs for victim movement.

5.3.2 Direct a team in the operation of a rope rescue system to remove a victim suspended from rope or webbing in a high-angle environment, given a victim suspended by a harness attached to anchored rope or webbing, systems for removal of the victim from the rope or webbing, and a means of removal of the victim to the ground or other safe area, so that risks to victims and rescuers are minimized, injury to the victim is minimized, the means of attachment to the rope rescue system is maintained, the victim is removed from the rope or webbing, and the victim is brought to a safe area for transfer to EMS.

(A)* Requisite Knowledge. Techniques and systems for safe transfer of suspended victims from an existing anchored rope or webbing to a rope rescue system, various techniques for handling suspended victims, and principles of suspension-induced injuries.

(B) Requisite Skills. Select and construct systems for rapid removal of victims from lanyards or rope or webbing, manage operation of the selected system, determine condition of the suspended victim, reduce hazards for rescuers and victims, and determine specialized equipment needs for victim movement.

Δ 5.3.3* While suspended from a rope rescue system, perform the transfer of a victim suspended from rope or webbing in a high-angle environment to a separate rope rescue lowering or mechanical advantage system, given a rope rescue system, a specified minimum travel distance for the victim, victim transfer systems, and specialized equipment necessary for the environment, so that risks to victims and rescuers are minimized, undesirable victim movement during the transfer is minimized, the means of attachment to the rope rescue system is maintained, the victim is removed from the static line and lowered or raised to a stable surface, victim positioning is managed to reduce adverse effects associated with suspension-induced injuries, selected specialized equipment facilitates efficient victim movement, and the victim can be transported to the local EMS provider.

(A) Requisite Knowledge. Task-specific selection criteria for victim transfer systems, various physical and psychological victim management techniques, PPE selection criteria, design

characteristics and intended purpose of various transfer systems, rigging principles, cause and effects of suspension-induced injuries, methods to minimize common environmental hazards, and hazards created in high-angle environments.

(B) Requisite Skills. The ability to choose victim transfer systems, select and use PPE appropriate to the conditions, perform a transfer of the victim from a static line to the lowering or mechanical advantage system, reduce hazards for rescuers and victims, and determine specialized equipment needs for victim movement.

5.3.4* Perform the activities of a litter tender in a high-angle lowering or raising operation, given a rope rescue system, a specified minimum travel distance for the litter tender, life safety harnesses, litters, bridles, and specialized equipment necessary for the environment, so that risks to victims and rescuers are minimized; the means of attachment to the rope rescue system is secure; and the travel path is negotiated while minimizing risks to equipment or persons.

(A) Requisite Knowledge. Task-specific selection criteria for life safety harnesses, PPE selection criteria, variations in litter design and intended purpose, high-angle litter attachment principles, techniques and practices for high-angle environments, and common hazards imposed by the various structures and terrain.

(B) Requisite Skills. The ability to select and use rescuer harness and PPE for common environments, attach the life safety harness to the rope rescue system, maneuver the litter past obstacles or natural structural features, manage the litter while attached to the rope rescue system, and evaluate surroundings for potential hazards.

5.3.5* Participate as a member of a team in the construction of a rope rescue system intended to move a suspended rescue load along a horizontal path to avoid an obstacle, given rescue personnel, life safety rope, rope rescue equipment, and a suitable anchor capable of supporting the load, so that personnel assignments are made and clearly communicated; the system constructed can accommodate the load; tension applied within the system will not exceed the rated capacity of any of its components' parts; a system safety check is performed; movement on the load is efficient; and loads can be held in place or moved with minimal effort over the required distance.

(A) Requisite Knowledge. Determination of incident needs as related to operation of a system, capabilities and limitations of various systems (including capacity ratings), methods for limiting excessive force to system components, incident site evaluation as related to interference concerns and obstacle negotiation, rigging principles, system safety check protocol, common personnel assignments and duties, common and critical operational commands, and common problems and ways to minimize these problems during construction.

(B) Requisite Skills. The ability to determine incident needs as related to construction of a system, evaluate an incident site as related to interference concerns and setup, identify the obstacles or voids to be negotiated, select a system for defined task, perform system safety checks, use rigging principles that will limit excessive force to system components, and communicate with personnel effectively.

5.3.6* Direct a team in the operation of a rope system to move a suspended rescue load along a horizontal path, given rescue personnel, an established system, a target for the load, a load to

be moved, and PPE, so that the movement is controlled; the load is held in place when needed; operating methods do not stress the system to the point of failure; personnel assignments are made; tasks are communicated; and potential problems are identified, communicated, and managed.

(A) Requisite Knowledge. Determination of incident needs as related to the operation of a system, capabilities and limitations of various systems, incident site evaluation as related to interference concerns and obstacle negotiation, system safety check protocol, procedures to evaluate system components for compromised integrity, common personnel assignments and duties, common and critical operational commands, common problems and ways to minimize or manage those problems, and ways to increase the efficiency of load movement.

(B) Requisite Skills. The ability to determine incident needs, complete a system safety check, evaluate system components for compromised integrity, select personnel, communicate with personnel effectively, manage movement of the load, and evaluate for any potential problems.

Δ 5.3.7 Climb and traverse natural features or man-made structures that require the use of climbing aids, positioning equipment, or fall protection systems to prevent the fall or unwanted movement of the rescuer, given the equipment used by the agency, and a task that reflects the anticipated rescue environment so that the objective is achieved, the rescuer can perform the required task, and fall protection is maintained.

(A)* Requisite Knowledge. The application and limitations of climbing, positioning, and fall protection systems and equipment commensurate with the organization's needs.

(B) Requisite Skills. The ability to climb vertical or near-vertical paths using the surfaces provided by the environment or climbing aids used by the agency and the use of positioning equipment to support the weight of the rescuer in a vertical or near-vertical environment permitting the rescuer to perform a task.

5.3.8* Interact with a person at height who is in an emotional or psychological crisis given an environment consistent with the mission of the agency, the policies and procedures of the organization, and a person in a crisis scenario so that the condition is recognized and communicated to the team, the rescuer is prevented from harm, and the actions of the rescuer do not escalate the incident.

(A) Requisite Knowledge. Indicators of a person in emotional crisis, typical triggers that can cause individuals to become agitated or anxious, methods of interacting to prevent harm to the rescuer and the subject, and best practices to de-escalate incidents involving persons in crisis.

(B) Requisite Skills. Methods of approach that minimize the risk to the rescuer from subjects whose psychological or emotional state is unknown, interview techniques that provide insight to the motives and state of mind of the subject, and communicating and interacting with the subject in a manner that does not escalate the incident.

5.3.9* Ascend a fixed rope in a high-angle environment, given an anchored fixed-rope system, a specified minimum distance for the rescuer, a system to allow ascent of a fixed rope, a structure, a belay system, a life safety harness worn by the person ascending, and PPE, so that the person ascending is secured to the fixed rope in a manner that will not allow him or her to

fall, the person ascending is attached to the rope by means of an ascent control device(s) with at least two points of contact, injury to the person ascending is minimized, the person ascending can stop at any point on the fixed rope and rest suspended by his or her harness, the system will not be stressed to the point of failure, the person ascending can convert his or her ascending system to a descending system, obstacles are negotiated, the system is suitable for the site, and the objective is reached.

(A) Requisite Knowledge. Task-specific selection criteria for life safety harnesses and systems for ascending a fixed rope, PPE selection criteria, design and intended purpose of ascent control devices utilized, rigging principles, techniques for high-angle environments, converting ascending systems to descending systems, and common hazards posed by maneuvering and harnessing.

(B) Requisite Skills. The ability to select and use rescuer harness, a system for ascending a fixed rope, and PPE for common environments; attach the life safety harnesses to the rope rescue system; configure ascent control devices to form a system for ascending a fixed rope; make connections to the ascending system; maneuver around existing environment and system-specific obstacles; convert the ascending system to a descending system while suspended from the fixed rope; and evaluate surroundings for potential hazards.

5.3.10* Descend a fixed rope in a high-angle environment, given an anchored fixed-rope system, a specified minimum travel distance for the rescuer, a system to allow descent of a fixed rope, a belay system, a life safety harness worn by the person descending, and PPE, so that the person descending is attached to the fixed rope in a manner that will not allow him or her to fall, the person descending is attached to the rope by means of a descent control device, the speed of descent is controlled, injury to the person descending is minimized, the person descending can stop at any point on the fixed rope and rest suspended by his or her harness, the system will not be stressed to the point of failure, the system is suitable for the site, and the objective is reached.

(A) Requisite Knowledge. Task-specific selection criteria for life safety harnesses and systems for descending a fixed rope; PPE selection criteria; design, intended purpose, and operation of descent control devices utilized; safe rigging principles; techniques for high-angle environments; and common hazards posed by maneuvering and harnessing.

(B) Requisite Skills. The ability to select and use rescuer harnesses, a system for descending a fixed rope, and PPE for common environments; attach the life safety harness to the rope rescue system; make attachment of the descent control device to the rope and life safety harness; operate the descent control device; maneuver around existing environment and system-specific obstacles; and evaluate surroundings for potential hazards.

5.3.11 Demonstrate the ability to escape from a jammed or malfunctioning device during a fixed-rope descent in a high-angle environment, given an anchored fixed-rope system with a simulated malfunctioning descent control device, a system to allow escape from the malfunctioning device, a belay system, a life safety harness worn by the person descending, and PPE, so that the person descending is attached to the fixed rope in a manner that will not allow him or her to fall, the person descending is attached to the rope by means of a descent

control device, the means for escape will allow the rescuer to escape either upward or downward from the malfunctioning descent control device, injury potential to the rescuer is minimized, the system will not be stressed to the point of failure, the system is suitable for the site, and the objective is reached.

(A) Requisite Knowledge. Task-specific selection criteria for escape equipment and methods used for escape from a malfunctioning descent control device; PPE selection criteria; design, intended purpose, and operation of escape systems utilized; safe rigging principles; techniques for high-angle environments; and common hazards posed by malfunctioning descent control devices.

(B) Requisite Skills. The ability to select and use rescuer harnesses, a system for escaping a malfunctioning descent control device, and PPE for common environments; attach the life safety harness to the rope rescue system; make attachment of the descent control device to the rope and life safety harness; attach and operate the escape system to remove the rescuer from the malfunctioning descent control device while maintaining patent attachment to the fixed rope and belay; use the escape system to maneuver upward or downward from the malfunctioning descent control device; and evaluate surroundings for potential hazards.

Chapter 6 Structural Collapse Rescue

6.1 Awareness Level. Prior to qualification at the awareness level in structural collapse rescue, the individual shall meet the requirements defined in Section 6.1.

6.1.1 Identify incident hazards, given a specific type of collapse incident, so that construction type is determined, all associated hazards are identified, and rescue time constraints are taken into account.

(A) Requisite Knowledge. Resource capabilities and limitations, types and nature of incident hazards, isolation terminology, methods and equipment, implementation techniques, operational requirement concerns, common risks in collapse incidents, risk/benefit analysis methods and practices, construction types and collapse characteristics, 13 building collapse types, subsequent collapse potential and causes, and associated types of technical references.

Δ (B) Requisite Skills. The ability to identify resource capabilities and limitations, identify incident hazards based on construction type, identify collapse zones, assess victim viability based on collapse type and access (risk/benefit), utilize technical references, and operate control and mitigation equipment.

6.1.2 Initiate a search, given PPE, an incident location, and victim investigative information, so that search parameters are established and include surface and nonentry void search, the information found is updated and relayed to command, the personnel assignments match their expertise, all victims are located as quickly as possible, risks to searchers are minimized, and accountability is achieved.

(A) Requisite Knowledge. Local policies and procedures, basic sight and hailing search techniques, and operational techniques necessary to operate in the search environment.

(B) Requisite Skills. The ability to use hailing techniques, PPE, and triangulation methods, and to provide for and perform self-escape/self-rescue.

6.1.3 Apply the building marking system given a structural collapse incident, so that the search phase of the floor or structure is marked, victim locations and condition are applied to the area, hazards are noted on the structure, and the access and egress points are marked.

Δ (A) Requisite Knowledge. FEMA and United Nations International Search and Rescue Advisory Group (INSARAG) search marking systems, victim marking systems, structural marking systems, and the location criteria for application of each system.

(B) Requisite Skills. The ability to use marking materials, and recognize hazards.

• 6.1.4 Move a victim, given victim transport equipment, litters, other specialized equipment, and victim removal systems specific to the rescue environment, so that the victim is moved without further injuries, risks to rescuers are minimized, the victim is secured to the transfer device, and the victim is removed from the hazard.

(A) Requisite Knowledge. Types of transport equipment and removal systems, selection factors with regard to specific rescue environments, methods to reduce and prevent further injuries, types of risks to rescuers, ways to secure the victim to transport devices, and transport techniques.

(B) Requisite Skills. The ability to secure a victim to transport equipment, assemble and operate environment-specific victim removal systems, and choose an incident-specific transport device.

N 6.1.5 Perform collapse support operations at a rescue incident, given an assignment and available resources, so that scene lighting is provided for the tasks to be undertaken, environmental concerns are addressed, personnel rehabilitation is facilitated, and the support operations facilitate rescue operational objectives.

N (A) Requisite Knowledge. Resource management protocols, principles for establishing lighting, environmental control methods, and rescuer rehabilitation protocols.

N (B) Requisite Skills. The ability to access resources, setup lights, initiate environmental controls, and setup rehabilitation for rescuers.

N 6.1.6 Size up a structural collapse rescue incident, given background information and applicable reference materials, so that the scope of the rescue is determined, the number of victims is identified, the last reported location of all the victims is established, witnesses and reporting parties are identified and interviewed, resource needs are assessed, primary search parameters are identified, and the information required to develop an initial incident action plan is obtained.

N (A) Requisite Knowledge. Types of reference materials and their uses, availability and capability of the resources, elements of an incident action plan and related information, relationship of the size-up to the incident management system, information gathering techniques and how that information is used in the size-up process, and basic search criteria for structural collapse rescue incidents.

N (B) Requisite Skills. The ability to read technical rescue reference materials, gather information, use interview techniques, relay information, and use information-gathering sources.

N 6.1.7 Recognize the need for technical rescue resources at an operations- or technician-level incident, given AHJ guidelines, so that the need for additional resources is identified, the response system is initiated, the scene is secured and rendered safe until additional resources arrive, and Awareness-level personnel are incorporated into the operational plan.

N (A) Requisite Knowledge. Operational protocols, specific planning forms, types of incidents common to the AHJ, hazards, incident support operations and resources, and safety measures.

N (B) Requisite Skills. The ability to apply operational protocols, select specific planning forms based on the types of incidents, identify and evaluate various types of hazards within the AHJ, request support and resources, and determine the required safety measures.

Δ 6.2 Operations Level. The job performance requirements defined in Sections 6.1 and 6.2 shall be met prior to or during operations-level qualification in structural collapse rescue.

6.2.1* Conduct a size-up of a light frame or unreinforced masonry (URM) collapsed structure, given an incident and specific incident information, so that existing and potential conditions within the structure and the immediate periphery are evaluated, needed resources are defined, hazards are identified, construction and occupancy types are determined, collapse type is identified if possible, the need for rescue is assessed, a scene security perimeter is established, and the size-up is conducted within the scope of the incident management system.

(A) Requisite Knowledge. Identification of light frame and URM construction types, characteristics, and probable occupant locations; methods to assess rescue needs; expected behavior of light frame and URM construction in a structural collapse incident; causes and associated effects of structural collapses; types and capabilities of resources; general hazards associated with structural collapse and size-up; and procedures for implementing site control and scene management.

(B) Requisite Skills. The ability to categorize light frame and URM construction types, evaluate structural stability and hazards, and implement resource and security (scene management) protocols.

6.2.2 Determine potential victim locations in light frame and URM construction collapse incidents, given size-up information, a structural collapse tool kit, the type of construction and occupancy, time of day, and collapse pattern, so that search areas are established and victims can be located.

(A) Requisite Knowledge. Capabilities and limitation of search instruments and resources, types of building construction, occupancy classifications, collapse patterns, victim behavior, and potential areas of survivability.

(B) Requisite Skills. The ability to use size-up information, occupancy classification information, and search devices, and assess and categorize type of collapse.

6.2.3 Develop a collapse rescue incident action plan, given size-up information and a light frame and URM construction collapsed structure, so that initial size-up information is utilized, an incident management system is incorporated, existing and potential conditions within the structure and the immediate periphery are included, specialized resource needs are identified, work perimeters are determined, collapse type/

category and associated hazards are identified, construction and occupancy types are determined, incident objectives are established, and scene security measures are addressed.

(A) Requisite Knowledge. Incident-specific size-up information, incident management system components, dynamics of incident conditions and peripheral areas, incident-specific resources in a given geographical area, construction and occupancy types, scene security requirements, personnel needs and limitations, and rescue scene operational priorities.

(B) Requisite Skills. The ability to utilize size-up information, implement an incident management system, monitor changing conditions specific to the incident, identify potential specialized resources, determine construction and occupancy types, identify specific incident security requirements, and create written documentation.

6.2.4 Implement a collapse rescue incident action plan, given an action plan and a light frame and URM construction collapsed structure, so that pertinent information is used, an incident management system is established and implemented, monitoring of dynamic conditions internally and externally is established, specialized resources are requested, hazards are mitigated, victim rescue and extraction techniques are consistent with collapse and construction type, and perimeter security measures are established.

(A) Requisite Knowledge. Components of an action plan specific to collapse incidents, incident management systems, dynamics of incident conditions and peripheral areas, identification of specialized resource lists, hazard identification, rescue and extrication techniques consistent with each collapse and construction type, perimeter security measures, and personnel needs and limitations.

(B) Requisite Skills. The ability to implement the components of an action plan in a collapse incident, implement an incident management system, initiate hazard mitigation objectives, request specialized resources, initiate rescue objectives, and demonstrate perimeter security measures.

6.2.5 Search a light frame and URM construction collapsed structure, given PPE, the structural collapse tool kit, an assignment, operational protocols, and size-up information, so that all victim locations and potential hazards are identified, marked, and reported; protocols are followed; the mode of operation can be determined; and rescuer safety is maintained. (See also Annex G.)

(A) Requisite Knowledge. Concepts and operation of the incident management system as applied to the search function, application of specialty tools and locating devices, application of recognized marking systems, voice sounding techniques, potential victim locations as related to the type of structure and occupancy, building construction, collapse types and their influence on the search function, operational protocols, and various hazards and their recognition.

(B) Requisite Skills. The ability to implement an incident management system, apply search techniques, use marking systems, identify and mitigate hazards, and select and use victim locating devices.

6.2.6* Stabilize a collapsed light frame and URM construction structure as a member of a team, given size-up information, a specific pattern of collapse, a basic structural collapse tool kit, and an assignment, so that strategies to effectively minimize the

movement of structural components are identified and implemented; hazard warning systems are established and understood by participating personnel; hazard-specific PPE is identified, provided, and utilized; physical hazards are identified; confinement, containment, and avoidance measures are discussed; and a rapid intervention team is established and staged.

(A) Requisite Knowledge. Identification and required care of PPE; structural load calculations for shoring system requirements; shoring systems for stabilization; specific hazards associated with light frame and URM construction structural collapse; strategic planning for collapse incidents; communications and safety protocols; atmospheric monitoring equipment needs; identification, characteristics, expected behavior, type, causes, and associated effects of light frame and URM construction structural collapses; and recognition of, potential for, and signs of impending secondary collapse.

(B) Requisite Skills. The ability to select and construct shoring systems for collapses in light frame and URM construction structures, use PPE, perform structural load calculations, determine resource needs, select and operate basic and specialized tools and equipment, implement communications and safety protocols, and mitigate specific hazards associated with shoring tasks.

• **6.2.7** Release a victim from entrapment by components of a light frame and URM construction collapsed structure, given PPE and resources for breaching, breaking, lifting, prying, shoring, and/or otherwise moving or penetrating the offending structural component, so that hazards to rescue personnel and victims are minimized, considerations are given to compartment syndrome due to crush injuries, techniques enhance patient survivability, tasks are accomplished within projected time frames, and techniques do not compromise the integrity of the existing structure or structural support systems.

(A) Requisite Knowledge. Identification, utilization, and required care of PPE; general hazards associated with each type of structural collapse; methods of evaluating structural integrity; compartment syndrome protocols; identification of construction types and collapse characteristics of light-frame and URM construction structures; causes and associated effects of structural collapses; potential signs of impending secondary collapse; selection and application of rescue tools and resources; and risk/benefit assessment techniques for extrication methods and time constraints.

(B) Requisite Skills. The ability to select, use, and care for PPE, operate rescue tools and stabilization systems, recognize compartment syndrome indicators, and complete risk/benefit assessments for selected methods of rescue and time constraints.

6.2.8* Remove a victim from a light-frame and URM construction collapse incident, given a disentangled victim, a basic first aid kit, and victim packaging resources, so that basic life functions are supported as required, victim is evaluated for signs of compartment syndrome due to crush injuries, advanced life support is called if needed, methods and packaging devices selected are compatible with intended routes of transfer, universal precautions are employed to protect personnel from bloodborne pathogens, and extraction times meet time constraints for medical management.

(A) Requisite Knowledge. Identification, utilization, and required care of PPE resources for structural collapse incidents; general hazards associated with structural collapse; identification of light-frame and URM construction types; characteristics and expected behavior of each type in a structural collapse incident; causes and associated effects of structural collapses; recognition of potential for and signs of impending secondary collapse; characteristic mechanisms of compartment syndrome due to crush injuries and basic life support; and patient packaging principles.

(B) Requisite Skills. Selection, use, and care of PPE, basic prehospital care of soft-tissue injuries, fracture stabilization, airway maintenance techniques, and cardiopulmonary resuscitation; and selection and use of patient packaging equipment.

6.2.9* Lift a heavy load as a team member, given a structural collapse tool kit and a load to be lifted, so that the load is lifted; control and stabilization are maintained before, during, and after the lift; and access can be gained.

(A) Requisite Knowledge. Applications of levers; classes of levers; principles of leverage, gravity, and load balance; resistance force; mechanics of load stabilization; mechanics of load lifting; application of pneumatic, hydraulic, mechanical, and manual lifting tools; how to calculate the weight of the load; safety protocols; and stabilization systems.

(B) Requisite Skills. The ability to evaluate and estimate the weight of the load, the operations of lifting tools, the application of a lever, and the application of load stabilization systems.

6.2.10* Move a heavy load as a team member, given a structural collapse tool kit, so that the load is moved the required distance to gain access and so that control is constantly maintained.

(A) Requisite Knowledge. Applications of rigging systems, applications of levers, classes of levers, inclined planes, gravity and load balance, friction, mechanics of load stabilization and load lifting, capabilities and limitations of lifting tools, how to calculate the weight of the load, and safety protocols.

(B) Requisite Skills. The ability to evaluate and estimate the weight of the load, operate required tools, construct and use levers and incline planes, utilize rigging systems, and stabilize the load.

6.2.11 Breach light frame and URM construction structural components, given an assignment, PPE, various types of construction materials, and a structural collapse tool kit, so that the opening supports the rescue objectives, the necessary tools are selected, structural stability is maintained, and the methods utilized are safe and efficient.

(A) Requisite Knowledge. Effective breaching techniques; types of building construction and characteristics of materials used in each; the selection, capabilities, and limitations of tools; safety protocols for breaching operations; calculation of weight; and anticipation of material movement during breaching and stabilization techniques.

(B) Requisite Skills. Select and use breaching tools, implement breaching techniques based on building frame and URM construction types, use PPE, and apply stabilization where required.

6.2.12* Construct cribbing systems, given an assignment, PPE, a structural collapse tool kit, various lengths and dimensions of

lumber, wedges, and shims, so that the cribbing system will safely support the load, the system is stable, and the assignment is completed.

(A) Requisite Knowledge. Different types of cribbing systems and their construction methods, limitations of construction lumber, load calculations, principles of and applications for cribbing, and safety protocols.

(B) Requisite Skills. The ability to select and construct cribbing systems, evaluate the structural integrity of the system, determine stability, and calculate loads.

6.2.13 Maintain hazard-specific PPE, given clothing or equipment for the protection of the rescuers, including respiratory protection, cleaning and sanitation supplies, maintenance logs or records, inspection procedures, and such tools and resources as are indicated by the manufacturer's guidelines for assembly or disassembly of components during repair or maintenance, so that damage, defects, and wear are identified and reported or repaired; equipment functions as designed; and preventive maintenance has been performed and documented consistent with the manufacturer's recommendations.

(A) Requisite Knowledge. Functions, construction, and operation of PPE; use of record-keeping systems of the AHJ; requirements and procedures for cleaning, sanitizing, and infectious disease control; use of provided assembly and disassembly tools; manufacturer and department recommendations; preuse inspection procedures; and ways to determine operational readiness.

(B) Requisite Skills. The ability to identify wear and damage indicators for PPE; evaluate operational readiness of PPE; complete logs and records; use cleaning equipment, supplies, and reference materials; and select and use tools specific to the task.

6.2.14 Maintain rescue equipment, given maintenance logs and records, tools, and resources as indicated by the manufacturer's guidelines, inspection procedures, equipment replacement protocol, and organizational standard operating procedure, so that the operational status of equipment is verified and documented, all components are checked for operation, deficiencies are repaired or reported as indicated by standard operating procedure, and items subject to replacement are correctly disposed of and changed out.

(A) Requisite Knowledge. Functions and operations of rescue equipment, use of record-keeping systems, manufacturer and organizational care and maintenance requirements, selection and use of maintenance tools, replacement protocol and procedures, disposal methods, and organizational standard operating procedures.

(B) Requisite Skills. The ability to identify wear and damage indicators for rescue equipment, evaluate operation readiness of equipment, complete logs and records, and select and use maintenance tools.

6.2.15* Terminate an incident, given PPE specific to the incident, isolation barriers, and tool kit, so that rescuers and bystanders are protected and accounted for during termination operations; the party responsible is notified of any modification or damage created during the operational period; documentation of loss or material use is accounted for; scene documentation is performed, scene control is transferred to a responsible party; potential or existing hazards are communicated to that

responsible party; debriefing and postincident analysis and critique are considered, and command is terminated.

(A) Requisite Knowledge. PPE characteristics, hazard and risk identification, isolation techniques, statutory requirements identifying responsible parties, accountability system use, reporting methods, postincident analysis techniques.

Δ (B) Requisite Skills. Selection and use of hazard-specific PPE, decontamination, use of barrier protection techniques, data collection and record-keeping/reporting protocols, postincident analysis activities.

Δ 6.3 Technician Level. The job performance requirements defined in Sections 6.2 and 6.3 shall be met prior to or during technician-level qualification in structural collapse rescue.

6.3.1 Conduct a size-up of a collapsed heavy construction-type structure, given an incident and specific incident information, so that existing and potential conditions within the structure and the immediate periphery are evaluated, needed resources are defined, hazards are identified, construction and occupancy types are determined, collapse type is identified if possible, the need for rescue is assessed, a scene security perimeter is established, and the size-up is conducted within the scope of the incident management system. (See Annexes E, G, and F for additional information.)

(A) Requisite Knowledge. Identification of heavy construction types, characteristics, and probable occupant locations; methods to assess rescue needs; expected behavior of heavy construction in a structural collapse incident; causes and associated effects of structural collapses; types and capabilities of resources; general hazards associated with structural collapse and size-up; and procedures for implementing site control and scene management.

(B) Requisite Skills. The ability to categorize heavy construction types, evaluate structural stability and hazards, and implement resource and security (scene management) protocols.

6.3.2 Determine potential victim locations in a heavy construction-type incident, given size-up information, a structural collapse tool kit, the type of construction and occupancy, time of day, and collapse pattern, so that search areas are established and victims can be located.

(A) Requisite Knowledge. Capabilities and limitation of search instruments and resources, types of building construction, occupancy classifications, collapse patterns, victim behavior, and potential areas of survivability.

(B) Requisite Skills. The ability to use size-up information, occupancy classification information, and search devices, and assess and categorize type of collapse.

6.3.3 Develop a collapse rescue incident action plan, given size-up information and a heavy collapsed structure, so that initial size-up information is utilized, an incident management system is incorporated, existing and potential conditions within the structure and the immediate periphery are included, specialized resource needs are identified, work perimeters are determined, collapse type/category and associated hazards are identified, construction and occupancy types are determined, incident objectives are established, and scene security measures are addressed.

(A) Requisite Knowledge. Incident-specific size-up information, incident management system components, dynamics of

incident conditions and peripheral areas, incident-specific resources in a given geographical area, construction and occupancy types, scene security requirements, personnel needs and limitations, and rescue scene operational priorities.

(B) Requisite Skills. The ability to utilize size-up information, implement an incident management system, monitor changing conditions specific to the incident, identify potential specialized resources, determine construction and occupancy types, identify specific incident security requirements, and create written documentation.

6.3.4 Implement a collapse rescue incident action plan, given an action plan and a heavy construction-type collapsed structure, so that pertinent information is used, an incident management system is established and implemented, monitoring of dynamic conditions internally and externally is established, specialized resources are requested, hazards are mitigated, victim rescue and extraction techniques are consistent with collapse and construction type, and perimeter security measures are established.

(A) Requisite Knowledge. Components of an action plan specific to collapse incidents, incident management systems, dynamics of incident conditions and peripheral areas, identification of specialized resource lists, hazard identification, rescue and extrication techniques consistent with each collapse and construction type, perimeter security measures, and personnel needs and limitations.

(B) Requisite Skills. The ability to implement the components of an action plan in a collapse incident, implement an incident management system, initiate hazard mitigation objectives, request specialized resources, initiate rescue objectives, and demonstrate perimeter security measures.

6.3.5 Search a heavy construction-type collapsed structure, given PPE, the structural collapse tool kit, an assignment, operational protocols, and size-up information, so that all victim locations and potential hazards are identified, marked, and reported; protocols are followed; the mode of operation can be determined; and rescuer safety is maintained. (See also Annex F.)

(A) Requisite Knowledge. Concepts and operation of the incident management system as applied to the search function, application of specialty tools and locating devices, application of recognized marking systems, voice sounding techniques, potential victim locations as related to the type of structure and occupancy, building construction, collapse types and their influence on the search function, operational protocols, and various hazards and their recognition.

(B) Requisite Skills. The ability to implement an incident management system, apply search techniques, use marking systems, identify and mitigate hazards, and select and use victim locating devices.

6.3.6* Stabilize a collapsed heavy construction-type structure as a member of a team, given size-up information, a specific pattern of collapse, a basic structural collapse tool kit, and an assignment, so that strategies to effectively minimize the movement of structural components are identified and implemented; hazard warning systems are established and understood by participating personnel; hazard-specific PPE is identified, provided, and utilized; physical hazards are identified; confinement, containment, and avoidance measures are discussed; and a rapid intervention team is established and staged.

(A) Requisite Knowledge. Identification and required care of PPE; structural load calculations for shoring system requirements; shoring systems for stabilization; specific hazards associated with heavy structural collapse; strategic planning for collapse incidents; communications and safety protocols; atmospheric monitoring equipment needs; identification, characteristics, expected behavior, type, causes, and associated effects of heavy structural collapses; and recognition of, potential for, and signs of impending secondary collapse.

(B) Requisite Skills. The ability to select and construct shoring systems for collapses in heavy structures, use PPE, perform structural load calculations, determine resource needs, select and operate basic and specialized tools and equipment, implement communications and safety protocols, and mitigate specific hazards associated with shoring tasks.

6.3.7 Release a victim from entrapment by components of a heavy construction-type collapsed structure, given PPE and resources for breaching, breaking, lifting, prying, shoring, and/or otherwise moving or penetrating the offending structural component, so that hazards to rescue personnel and victims are minimized, considerations are given to compartment syndrome due to crush injuries, techniques enhance patient survivability, tasks are accomplished within projected time frames, and techniques do not compromise the integrity of the existing structure or structural support systems.

(A) Requisite Knowledge. Identification, utilization, and required care of PPE; general hazards associated with each type of structural collapse; methods of evaluating structural integrity; compartment syndrome protocols; identification of construction types and collapse characteristics of heavy construction-type structures; causes and associated effects of structural collapses; potential signs of impending secondary collapse; selection and application of rescue tools and resources; and risk/benefit assessment techniques for extrication methods and time constraints.

(B) Requisite Skills. The ability to select, use, and care for PPE, operate rescue tools and stabilization systems, recognize compartment syndrome signs and symptoms, and complete risk/benefit assessments for selected methods of rescue and time constraints.

6.3.8 Remove a victim from a heavy construction-type collapse incident, given a disentangled victim, a basic first aid kit, and victim packaging resources, so that basic life functions are supported as required, victim is evaluated for signs of compartment syndrome, advanced life support is called if needed, methods and packaging devices selected are compatible with intended routes of transfer, universal precautions are employed to protect personnel from bloodborne pathogens, and extrication times meet time constraints for medical management.

(A) Requisite Knowledge. Identification, utilization, and required care of PPE resources for structural collapse incidents; general hazards associated with structural collapse; identification of heavy construction types; characteristics and expected behavior of each type in a structural collapse incident; causes and associated effects of structural collapses; recognition of, potential for, and signs of impending secondary collapse; characteristic mechanisms of injury and basic life support; and patient packaging principles.

Δ (B) Requisite Skills. Selection, use, and care of PPE; basic prehospital care of soft-tissue injuries; fracture stabilization;

airway maintenance techniques and cardiopulmonary resuscitation; signs and symptoms of compartment syndrome; and selection and use of patient packaging equipment.

6.3.9 Lift a heavy load as a team member, given a structural collapse tool kit and a load to be lifted, so that the load is lifted; control and stabilization are maintained before, during, and after the lift; and access can be gained.

(A) Requisite Knowledge. Applications of levers; classes of levers; principles of leverage, gravity, and load balance; resistance force; mechanics of load stabilization; mechanics of load lifting; application of pneumatic, hydraulic, mechanical, and manual lifting tools; how to calculate the weight of the load; safety protocols; and stabilization systems.

(B) Requisite Skills. The ability to evaluate and estimate the weight of the load, the operations of lifting tools, the application of a lever, and the application of load stabilization systems.

6.3.10 Move a heavy load as a team member, given a structural collapse tool kit, so that the load is moved the required distance to gain access and so that control is constantly maintained.

(A) Requisite Knowledge. Applications of rigging systems, applications of levers, classes of levers, inclined planes, gravity and load balance, friction, mechanics of load stabilization and load lifting, capabilities and limitations of lifting tools, how to calculate the weight of the load, and safety protocols.

(B) Requisite Skills. The ability to evaluate and estimate the weight of the load, operate required tools, construct and use levers and incline planes, utilize rigging systems, and stabilize the load.

6.3.11 Breach heavy structural components, given an assignment, PPE, various types of construction materials, and a structural collapse tool kit, so that the opening supports the rescue objectives, the necessary tools are selected, structural stability is maintained, and the methods utilized are safe and efficient.

(A) Requisite Knowledge. Effective breaching techniques; types of building construction and characteristics of materials used in each; the selection, capabilities, and limitations of tools; safety protocols for breaching operations; calculation of weight; and anticipation of material movement during breaching and stabilization techniques.

(B) Requisite Skills. Select and use breaching tools, implement breaching techniques based on building construction type, use PPE, and apply stabilization where required.

6.3.12 Construct cribbing systems, given an assignment, PPE, a structural collapse tool kit, various lengths and dimensions of lumber, wedges, and shims, so that the cribbing system will safely support the load, the system is stable, and the assignment is completed.

(A) Requisite Knowledge. Different types of cribbing systems and their construction methods, limitations of construction lumber, load calculations, principles of and applications for cribbing, and safety protocols.

(B) Requisite Skills. The ability to select and construct cribbing systems, evaluate the structural integrity of the system, determine stability, and calculate loads.

6.3.13* Stabilize a collapsed heavy construction-type structure as a member of a team, given size-up information, hazard-

specific PPE, an assignment, a specific pattern of collapse, a structural collapse tool kit, specialized equipment necessary to complete the task, and engineering resources if needed, so that hazard warning systems are established and understanding by team members is verified, all unstable structural components that can impact the work and egress routes are identified, alternative egress routes are established when possible, expert resource needs are determined and communicated to command, load estimates are calculated for support system requirements, all shoring systems meet or exceed load-bearing demands, shoring systems are monitored continuously for integrity, safety protocols are followed, a rapid intervention crew (RIC) is established and staged to aid search and rescue personnel in the event of entrapment, an accountability system is established, atmospheric monitoring is ongoing, and progress is communicated as required.

(A) Requisite Knowledge. Identification and required care of PPE, structural load calculations for shoring system requirements, shoring systems for stabilization, specific hazards associated with heavy structural collapse, hazard warning systems, specialized resource and equipment needs, communications and rescuer safety protocols, atmospheric monitoring equipment needs, identification of construction types, characteristics and expected behavior of each type in a structural collapse incident, causes and associated effects of structural collapses, and recognition of potential for and signs of impending secondary collapse.

(B) Requisite Skills. The ability to select and construct shoring systems for heavy construction-type collapses, use PPE, perform structural load calculations, determine resource needs, select and operate basic and specialized tools and equipment, implement communications and rescuer safety protocol, and mitigate specific hazards associated with shoring tasks.

6.3.14 Cut through structural steel, given a structural collapse tool kit, PPE, and an assignment, so that the steel is efficiently cut, the victim and rescuer are protected, fire control measures are in place, and the objective is accomplished.

(A) Requisite Knowledge. Safety considerations; the selection, capabilities, and limitations of steel cutting tools; cutting tool applications; types of potential and actual hazards and mitigation techniques; and characteristics of steel used in building construction.

(B) Requisite Skills. The ability to assess tool needs, use cutting tools, implement necessary extinguishment techniques, mitigate hazards, and stabilize heavy loads.

6.3.15 Coordinate the use of heavy equipment, given PPE, means of communication, equipment and operator, and an assignment, so that common communications are established, equipment usage supports the operational objective, hazards are avoided, and rescuer and operator safety protocols are followed.

(A) Requisite Knowledge. Types of heavy equipment, capabilities, application and hazards of heavy equipment and rigging, safety protocols, and types and methods of communication.

(B) Requisite Skills. The ability to use hand signals and radio equipment, recognize hazards, assess for operator and rescuer safety, and use PPE.

Chapter 7 Confined Space Rescue

7.1 Awareness Level. Prior to qualification at the awareness level in confined space rescue, the individual shall meet the requirements defined in Section 7.1.

7.1.1 Initiate isolation procedures for a specific confined space incident, given scene control barriers, personal protective equipment (PPE), requisite equipment, and available specialized resources, so that all hazards are identified; unauthorized entry to the confined space and adjacent areas are controlled; resource application fits the operational requirements; hazard isolation is considered; risks to rescuers, bystanders, and victims are minimized; and rescue time constraints are taken into account.

(A) Requisite Knowledge. Resource capabilities and limitations, hazard recognition, isolation methods and terminology, methods for controlling access to the scene, and types of technical references.

(B) Requisite Skills. The ability to identify resource capabilities and limitations, identify potential hazards to rescuers and bystanders, identify potential paths for entry to the confined space and its adjacent areas, utilize scene entry control methods, place scene control barriers, and operate control and mitigation equipment.

7.1.2 Initiate a search in areas immediately adjacent to the confined space, given hazard-specific PPE, equipment pertinent to search mission, a confined space incident location, and victim investigative information, so that search parameters are established, the victim survival profile is established, the access and egress of all people either involved in the search or already within the search area are questioned and the information is updated and relayed to command, the personnel assignments match their expertise, all victims in the adjacent areas to the confined space are located as quickly as possible, applicable technical rescue concerns are managed, risks to searchers are minimized, and all searchers are accounted for.

(A) Requisite Knowledge. Local policies and procedures and how to operate in the environment surrounding the area of the confined space access area.

(B) Requisite Skills. The ability to enter, maneuver in, and exit the adjacent areas to the confined space incident and perform escape from the area if conditions become untenable.

7.1.3* Communicate with victim(s), given a clear environment and a confined space, so that victim communication is established when possible and information relative to patient condition is documented and conveyed to incoming confined space rescue resources.

(A) Requisite Knowledge. Victim communication methods appropriate to confined spaces and use of information acquired for initial victim assessment.

(B) Requisite Skills. Use communication methods that are effective from the outside to the inside of a confined space, identify victim communication needs and use methods for documentation and transfer of victim information.

7.1.4 Perform nonentry rescue, given PPE; an anchored retrieval system attached to a victim located inside a confined space with a clear interior; safety, communication, and operational protocols; and a confined space rescue tool kit, so that the retrieval system is operated to extract the victim, the

rescuer is protected from fall hazards when working near unprotected edges, victim communication is established and maintained, the victim is managed through the portal and patient care is initiated on extraction.

(A) Requisite Knowledge. Principles of operation for retrieval equipment; methods for fall prevention; and safety, communication, medical, and operational protocols.

(B) Requisite Skills. The ability to use and apply PPE and fall prevention methods, operate nonentry rescue (retrieval) systems and equipment; implement safety, communication, and operational protocols; and use methods for assuring victim passage through the portal without obstruction.

N 7.1.5 Size up a confined space rescue incident, given background information and applicable reference materials, so that the scope of the rescue is determined, the number of victims is identified, the last reported location of all the victims is established, witnesses and reporting parties are identified and interviewed, resource needs are assessed, primary search parameters are identified, and information required to develop an initial incident action plan is obtained.

N (A) Requisite Knowledge. Types of reference materials and their uses, availability and capability of the resources, elements of an incident action plan and related information, relationship of the size-up to the incident management system, information gathering techniques and how that information is used in the size-up process, and basic search criteria for confined space rescue incidents.

N (B) Requisite Skills. The ability to read technical rescue reference materials, gather information, use interview techniques, relay information, and use information-gathering sources.

N 7.1.6 Recognize the need for technical rescue resources at an operations- or technician-level incident, given AHJ guidelines, so that the need for additional resources is identified, the response system is initiated, the scene is secured and rendered safe until additional resources arrive, and awareness-level personnel are incorporated into the operational plan.

N (A) Requisite Knowledge. Operational protocols, specific planning forms, types of incidents common to the AHJ, hazards, incident support operations and resources, and safety measures.

N (B) Requisite Skills. The ability to apply operational protocols, select specific planning forms based on the types of incidents, identify and evaluate various types of hazards within the AHJ, request support and resources, and determine the required safety measures.

N 7.1.7 Support an operations- or technician-level incident, given an incident, an assignment, an incident action plan, and resources from the tool kit, so that the assignment is carried out, progress is reported to command, environmental concerns are managed, personnel rehabilitation is facilitated, and the incident action plan is supported.

N (A) Requisite Knowledge. AHJ operational protocols, hazard recognition, incident management, PPE selection, resource selection and use, and scene support requirements.

N (B) Requisite Skills. The ability to apply operational protocols, function within an incident management system, follow and implement an incident action plan, and report the task progress status to a supervisor or incident command.

• **7.2 Operations Level.** The job performance requirements defined in Sections 5.2, 7.1, and 7.2 shall be met prior to or during operations-level qualification in confined space rescue.

7.2.1* Initiate a search inside a confined space in those areas immediately visible from the confined space entry portal, given hazard-specific PPE, equipment pertinent to search mission, a confined space, and victim investigative information, so that search parameters are established; the victim profile is established; the people in or around the search area are questioned and the information is updated and relayed to command; the personnel assignments match their expertise; all victims inside the space that are immediately visible from outside the portal are located and identified quickly; applicable technical rescue concerns are managed; risks to searchers are minimized; and all searchers are accounted for.

(A) Requisite Knowledge. Local policies and procedures and how to operate in the environment surrounding the area of the confined space access area.

(B) Requisite Skills. The ability to work in the immediate area of the confined space entry portal and perform immediate escape from the area if conditions become untenable.

7.2.2 Perform size-up of a confined space rescue incident, given background information and applicable reference materials, so that the type of rescue is determined, the number of victims is identified, the last reported location of all victims is established, witnesses and reporting parties are identified and interviewed, resource needs are assessed, search parameters are identified, and information required to develop an incident action plan is obtained.

(A) Requisite Knowledge. Types of reference materials and their uses, availability and capability of the resources, elements of an action plan and related information, relationship of size-up to the incident management system, and information gathering techniques and how that information is used in the size-up process.

(B) Requisite Skills. The ability to read technical rescue reference materials, gather information, relay information, and use information gathering sources.

7.2.3* Conduct monitoring of the environment, given monitoring equipment reference material, PPE, accurately calibrated detection and monitoring equipment, and size-up information, so that a representative sample of the space is obtained, accurate readings are made, readings are documented, and effects of ventilation in determining atmospheric conditions and the conditions of the space have been determined for exposures to existing or potential environmental hazards.

(A) Requisite Knowledge. Capabilities and limitations of detection and monitoring equipment, ways to confirm calibration, defining confined space configuration as it applies to obtaining a representative sample of space, basic physical properties of contaminants, and how to determine contents of a confined space.

(B) Requisite Skills. The ability to use and confirm calibration of detection and monitoring equipment and acquire representative samples of space.

7.2.4* Assess the incident, given size-up information, information from technical resources, monitoring equipment, and PPE required to perform the assessment, so that general area and

space-specific hazards are identified, bystanders and victims are interviewed, immediate and ongoing monitoring of the space is performed, the victims' conditions and location are determined, a risk/benefit analysis is performed, methods of ingress and egress for rescuer and victims are identified, rescue systems for victim removal are determined, and an emergency means of retrieval for rescue entrants is established.

(A) Requisite Knowledge. Use of size-up information and interview techniques; types of PPE; monitoring equipment protocols; rescue and retrieval systems; permit programs; types of and uses for available resources; risk/benefit analysis methods; common hazards and their influence on the assessment; methods to identify egress from and ingress into the space; and processes to identify size, type, and configuration of the opening(s) and internal configuration of the space.

(B) Requisite Skills. The ability to select and interpret size-up information, conduct interviews, choose and utilize PPE, operate monitoring equipment, identify hazard mitigation options, identify probable victim location, perform risk/benefit analysis, recognize characteristics and hazards of confined spaces, and evaluate specific rescue systems for confined space entry and retrieval of rescuers and victims during confined space incidents.

7.2.5 Control hazards, given PPE and a confined space tool kit, so that the rescue area is established; access to the incident scene is controlled; rescuers are protected from exposure to hazardous materials and atmospheres, all forms of harmful energy releases, and physical hazards; and victims are protected from further harm.

(A) Requisite Knowledge. PPE; safety protocols; monitoring equipment and procedures; ventilation equipment and procedures; incident hazards; types of hazardous materials exposure risks; forms, sources, and control of harmful energy and physical hazards in the confined space.

(B) Requisite Skills. The ability to utilize PPE, place scene control barriers, operate atmospheric monitoring equipment, ventilate a confined space, identify dangerous forms of energy, and mitigate physical and atmospheric hazards.

Δ **7.2.6*** Apply and use self-contained breathing apparatus (SCBA) as a rescue entrant, given a confined space incident requiring respiratory protection, a rescue assignment, a means of entry into and exit from the space, a rescue attendant outside the space, SCBA, breathing apparatus cylinders, and a confined space, so that the internal configuration of the space is clear and unobstructed so retrieval systems can be utilized for rescuers without possibility of entanglement, the victim can be seen easily from the outside of the space's primary access opening, rescuers can pass easily through the access/egress opening(s) with room to spare when PPE is worn in the manner recommended by the manufacturer, the space can accommodate two or more rescuers in addition to the victim, all hazards in and around the confined space have been identified and can be mitigated by using respiratory protection, the rescue entrant passes through the portal without removal of the SCBA, the assigned rescue duty is performed, the rescue entrant frequently assesses the level of air remaining in the cylinder and communicates this level to rescuers outside of the space, and the rescue entrant exits the space prior to activation of the low-pressure alarm on the SCBA.

(A) Requisite Knowledge. Capabilities and limitations of SCBA in confined space rescue, breathing air conservation and communication methods appropriate to breathing apparatus use in confined spaces.

(B) Requisite Skills. The ability to use SCBA in a confined space entry for rescue, use of breathing techniques that will conserve the air supply and use of communication methods that effectively convey information between rescuers inside and outside of the space.

Δ 7.2.7* Apply an atmosphere-supplying respirator to a victim, given a confined space incident requiring respiratory protection, a live victim, an atmosphere-supplying respirator and associated equipment, and a confined space, so that the internal configuration of the space is clear and unobstructed so retrieval systems can be utilized for rescuers without possibility of entanglement; the victim can be easily seen from the outside of the space's primary access opening; rescuers can pass easily through the access/egress opening(s) with room to spare when PPE is worn in the manner recommended by the manufacturer; the space can accommodate two or more rescuers in addition to the victim; all hazards in and around the confined space have been identified and can be mitigated by using respiratory protection; the apparatus face piece is applied rapidly, positioned properly on the face and without air leakage; application of the face piece can be performed simultaneously with spinal precautions; the breathing apparatus unit is securely placed during victim movement so the face piece will not be pulled from the victim's face during movement; the level of air remaining in the victim's breathing apparatus is frequently accessed and communicated; and the victim is removed from the space without interruption of the air supply.

(A) Requisite Knowledge. Capabilities and limitations of atmosphere supplying respirators (SCBA or SAR) for victims in confined space rescue, expected victim air usage, methods for application of face pieces to victims wearing helmets and for those with spinal injuries, methods for securement of a victim's breathing apparatus unit when packaged in litters, attached to rope rescue systems, or being dragged along a horizontal plane; and communication methods in confined spaces.

(B) Requisite Skills. The ability to apply a patent air supply to a victim in a confined space rescue, move the victim wearing breathing apparatus without interruption or compromise of their air supply or face piece seal; continuous monitoring of the victim's air supply during operations and use of communication methods that effectively convey information between rescuers inside and outside of the space.

Δ 7.2.8* Perform full spinal immobilization of a victim inside a confined space, given a confined space incident requiring spinal precautions, a victim, full spinal immobilization equipment, a second rescuer to assist, and a confined space, so that the internal configuration of the space is clear and unobstructed so retrieval systems can be utilized for rescuers without possibility of entanglement, the victim can be easily seen from the outside of the space's primary access opening, rescuers can pass easily through the access/egress opening(s) with room to spare when PPE is worn in the manner recommended by the manufacturer, the space can accommodate two or more rescuers in addition to the victim, all hazards in and around the confined space have been identified and can be mitigated by using respiratory protection so that the victim's cervical spine is manually maintained in a neutral position immediately on contact and maintained until the body and head are

completely immobilized and secure, victim movement onto the spinal immobilization device creates minimal manipulation of the spine, void spaces between the victim and immobilization device are padded as appropriate, victim securement to the immobilization device will prevent spinal manipulation during movement, and applicable local treatment protocols are followed.

(A) Requisite Knowledge. Capabilities and limitations of long spine immobilization equipment for victims in confined space rescue, methods for movement of a victim onto a long spine immobilizer with minimum spinal manipulation, methods for securement of a victim's body on a long spine immobilizer, methods for securement of a victim's head on a long spine immobilizer and other long spinal immobilization treatment modalities and procedures.

(B) Requisite Skills. The ability to maintain manual immobilization of a victim's head during the immobilization process, assist in moving the victim to a long spine immobilizer with only two persons with minimal spinal manipulation, apply void space padding as needed based on the immobilization device and apply and secure the victim's body and head to a long spinal immobilization device.

Δ 7.2.9 Prepare for entry into horizontally oriented confined space, given a confined space rescue tool kit and a confined space, so that the internal configuration of the space is clear and unobstructed so retrieval systems can be utilized for rescuers without possibility of entanglement, the victim can be easily seen from the outside of the space's primary access opening, rescuers can pass easily through the access/egress opening(s) with room to spare when PPE is worn in the manner recommended by the manufacturer, the space can accommodate two or more rescuers in addition to the victim, all hazards in and around the confined space have been identified and can be mitigated by using respiratory protection so that victim communication is established when possible, continuous atmospheric monitoring is initiated, rescuer readiness is verified, rescuers' limitations are identified and evaluated, rescuers unsuitable to confined space entry operations are reassigned and replaced, route and methods of entry are determined, and rescuer evacuation is planned.

(A) Requisite Knowledge. Effects of hazardous atmospheres on victims and rescuers, types and operation of required hazard-specific monitoring equipment, organization protocol for medical and psychological evaluation related to confined space entry, methods of entry into confined spaces in accordance with operational protocols, and rescuer evaluation methods.

(B) Requisite Skills. The ability to operate monitoring equipment, perform rescuer pre-entry medical exam, evaluate rescuer capabilities and limitations, identify victim communication needs, evaluate for point and route of confined space entry, and select evacuation methods.

Δ 7.2.10 Enter a horizontally oriented confined space for rescue, given PPE; safety, communication, and operational protocols; portable lighting; and a confined space rescue tool kit; a retrieval system; and a confined space, so that the internal configuration of the space is clear and unobstructed so retrieval systems can be utilized for rescuers without possibility of entanglement, the victim can be easily seen from the outside of the space's primary access opening, rescuers can pass easily through the access/egress opening(s) with room to spare when

PPE is worn in the manner recommended by the manufacturer, the space can accommodate two or more rescuers in addition to the victim, all hazards in and around the confined space have been identified and can be mitigated by using respiratory protection so that the victim is contacted, controlled confined space entry is established and maintained, atmosphere is monitored continuously, the victim's mental and physical conditions are assessed further, the rescue entrant is aided by portable lighting, rescue entrants are attached to retrieval lines at all times, patient care is initiated, the patient is packaged to restrictions of the space, and patient removal can be initiated.

(A) Requisite Knowledge. Principles of operation for atmospheric monitoring equipment; methods for patient care in confined spaces; portable lighting methods; safety, communication, medical, and operational protocols; and controlled confined space entry and egress procedures for confined spaces.

(B) Requisite Skills. The ability to use and apply PPE and rescue-related systems and equipment; use portable lighting in a darkened environment; implement safety, communication, and operational protocols; use medical protocols to determine treatment priorities; use medical equipment specific to confined space victim needs; and reassess and confirm mode of operation.

7.2.11* Package the victim in a litter for removal from a horizontally oriented confined space, given a confined space rescue tool kit, a litter and associated rigging equipment, a space that provides enough internal and external clearance to maneuver a litter in and around the space, so that the victim is secured to the litter; the litter is secured to the rescue system if needed, the litter will pass through the portal, the victim is protected during the extraction, and further harm to the victim is minimized.

(A) Requisite Knowledge. Spinal management techniques, victim packaging techniques, how to use low-profile packaging devices and equipment, methods to reduce or avoid damage to equipment, and the similarities and differences between packaging for confined spaces and for other types of rescue.

(B) Requisite Skills. The ability to immobilize a victim's spine; package victims in litters, low-profile devices, and litters; recognize and perform basic management of various traumatic injuries and medical conditions; support respiratory efforts; and perform local treatment modalities as required based on the environment.

7.2.12 Assemble a portable anchor system for application of a high point of attachment to a confined space rescue system given a portable anchor device, additional rescuers to assist in the assembly, and a vertically oriented space with a portal above which to set the portable anchor, so that the portable anchor is assembled in accordance with the manufacturer's recommendations, rescue systems are attached and secured to the anchor device and the portable anchor provides enough clearance above the portal to fully extract a victim packaged in a vertically oriented litter.

(A) Requisite Knowledge. Capabilities and limitations of portable anchor devices in confined space rescue, assembly procedures for the portable anchor utilized, methods for stabilization of portable anchors to prevent unnecessary movement, force application to portable anchors and proper direction of that force to prevent movement or collapse.

(B) Requisite Skills. The ability to assemble the portable anchor device with assistance of other rescuers, attach the rescue system to the portable anchor, position the device high enough to provide adequate clearance area above the portal to allow removal of a vertically oriented litter, and operate the system in a way that will keep the portable anchor stable while lifting a load.

Δ 7.2.13 Prepare for entry into vertically oriented confined space, given a confined space rescue tool kit and a confined space, so that the internal configuration of the space is clear and unobstructed so retrieval systems can be utilized for rescuers without possibility of entanglement, the victim can be easily seen from the outside of the space's primary access opening rescuers can pass easily through the access/egress opening(s) with room to spare when PPE is worn in the manner recommended by the manufacturer, the space can accommodate two or more rescuers in addition to the victim, all hazards in and around the confined space have been identified and can be mitigated by using respiratory protection so that victim communication is established when possible, continuous atmospheric monitoring is initiated, rescuer readiness is verified, rescuers' limitations are identified and evaluated, rescuers unsuitable to entry operations are reassigned and replaced, route and methods of confined space entry are determined, and rescuer evacuation is planned.

(A) Requisite Knowledge. Effects of hazardous atmospheres on victims and rescuers, types and operation of required hazard-specific monitoring equipment, organization protocol for medical and psychological evaluation related to entry, methods of entry into confined spaces in accordance with operational protocols, and rescuer evaluation methods.

(B) Requisite Skills. The ability to operate monitoring equipment, perform rescuer pre-entry medical exam, evaluate rescuer capabilities and limitations, identify victim communication needs, evaluate for point and route of confined space entry, and select evacuation methods.

Δ 7.2.14 Enter a vertically oriented confined space for rescue, given PPE; safety, communication, operational protocols; a confined space rescue tool kit; and a confined space, so that the internal configuration of the space is clear and unobstructed so retrieval systems can be utilized for rescuers without possibility of entanglement, the victim can be easily seen from the outside of the space's primary access opening, rescuers can pass easily through the access/egress opening(s) with room to spare when PPE is worn in the manner recommended by the manufacturer, the space can accommodate two or more rescuers in addition to the victim, all hazards in and around the confined space have been identified and can be mitigated by using respiratory protection so that the victim is contacted, controlled confined space entry is established and maintained, atmosphere is continuously monitored, the victim's mental and physical conditions are further assessed, patient care is initiated, the patient is packaged to restrictions of the space, and patient removal can be initiated.

(A) Requisite Knowledge. Principles of operation for atmospheric monitoring equipment; methods for patient care in confined spaces; safety, communication, medical, and operational protocols; and controlled confined space entry and egress procedures for confined spaces.

(B) Requisite Skills. The ability to use and apply PPE and rescue-related systems and equipment; implement safety,

communication, and operational protocols; use medical protocols to determine treatment priorities; use medical equipment specific to confined space victim needs; and reassess and confirm mode of operation.

7.2.15* Package the victim in a litter for removal from a vertically oriented confined space, given a confined space rescue tool kit, a vertically oriented litter and associated rigging equipment, a work area that provides enough vertical clearance to extract a vertically oriented litter and a victim, so that the victim is secured to the litter, the litter is secured to the rescue system in a vertically configuration, the litter will pass through the portal, the litter can be raised high enough to clear the portal, the victim is protected during the extraction, and further harm to the victim is minimized.

(A) Requisite Knowledge. Spinal management techniques, victim packaging techniques, how to use low-profile packaging devices and equipment, methods to reduce or avoid damage to equipment, and the similarities and differences between packaging for confined spaces and for other types of rescue.

(B) Requisite Skills. The ability to immobilize a victim's spine; package victims in litters, low-profile devices, and litters; recognize and perform basic management of various traumatic injuries and medical conditions; support respiratory efforts; and perform local treatment modalities as required based on the environment.

7.2.16* Remove a victim from a vertically oriented confined space, given a confined space rescue tool kit, victim harnesses and rigging, a victim who has been discovered to be in respiratory arrest, and conditions inside the space requiring immediate extraction to prevent imminent death of the victim, so that the victim is rapidly secured in an extraction harness, the harness is secured to the rescue system, and the victim is removed from the space.

(A) Requisite Knowledge. Rapid victim harness application techniques, methods to reduce or avoid damage to equipment, and the similarities and differences between packaging for conditions of imminent danger as compared to those that are stable.

(B) Requisite Skills. The ability to recognize the immediate threat and need for rapid extraction, and rapid application of victim harnesses and rigging to rescue systems.

7.2.17 Remove all entrants from a confined space, given PPE, rope and related rescue and retrieval systems, personnel to operate rescue and retrieval systems, and a confined space rescue tool kit, so that internal obstacles and hazards are negotiated, all persons are extricated from a space in the selected transfer device, the victim and rescuers are decontaminated as necessary, and the victim is delivered to the EMS provider.

(A) Requisite Knowledge. Personnel and equipment resource lists, specific PPE, types of confined spaces and their internal obstacles and hazards, rescue and retrieval systems and equipment, operational protocols, medical protocols, EMS providers, and decontamination procedures.

(B) Requisite Skills. The ability to select and use PPE, select and operate rescue and retrieval systems used for victim removal, utilize medical equipment, and use equipment and procedures for decontamination.

7.2.18* Terminate a technical rescue operation, given an incident scenario, assigned resources, and site safety data so that

rescuer risk and site safety are managed, scene security is maintained and custody transferred to a responsible party, personnel and resources are returned to a state of readiness, record-keeping and documentation occur, and post-event analysis is conducted.

(A) Requisite Knowledge. Incident Command functions and resources, hazard identification and risk management strategies, logistics and resource management, personnel accountability systems, and AHJ-specific procedures or protocols related to personnel rehab.

(B) Requisite Skills. Hazard recognition, risk analysis, use of site control equipment and methods, use of data collection and management systems, and use of asset and personnel tracking systems.

7.3 Technician Level. The job performance requirements defined in Sections 7.2 and 7.3 shall be met prior to or during technician-level qualification in confined space rescue.

7.3.1 Initiate a search inside a confined space in those areas not immediately visible from the confined space entry portal, given hazard-specific PPE, confined space rescue entrant(s) to perform the search, equipment pertinent to search mission, a confined space, and victim investigative information, so that search parameters are established; the victim profile is established; search result information is acquired and relayed to command; the personnel assignments match their expertise; all victims inside the space are located and identified quickly; applicable technical rescue concerns are managed; risks to searchers are minimized; and all searchers are accounted for.

(A) Requisite Knowledge. Local policies and procedures and how to operate inside the confined space.

(B) Requisite Skills. The ability to work inside the confined space; communicate with rescuers outside the confined space portal; and, when possible, perform self-rescue if conditions become untenable.

7.3.2 Preplan a confined space incident, given applicable guidelines and regulations and a preplan form, so that a standard approach is used during a confined space rescue emergency, hazards are recognized and documented, isolation methods are identified and documented, all accesses to the location of the confined space entry opening are identified and documented, all types of confined space entry openings are identified and documented, and internal configurations and special resource needs are documented for future rescuer use.

(A) Requisite Knowledge. Operational protocols, specific preplan forms, types of hazards common to jurisdictional boundaries, hazards that should and must be identified on preplans, isolation methods and issues related to preplanning, issues and constraints relating to the types of confined space openings, internal configuration special resource needs of a confined space, and applicable legal issues.

(B) Requisite Skills. The ability to select a specific preplan form; draft or draw a sketch of confined spaces; complete supplied forms; identify and evaluate various configurations of confined spaces, access points, confined space entry openings, isolation procedures, and energy control locations; recognize general and site-specific hazards; document all data; and apply all regulatory compliance references.

7.3.3 Apply and use supplied-air respirators (SARs) as a rescue entrant, given a confined space incident requiring respiratory

protection, a rescue assignment, a means of entry into and exit from the space, a rescue attendant outside the space, personnel to manage air lines outside of the space, a SAR, a breathing air supply system with air lines to supply the SAR, breathing apparatus cylinders, personnel to monitor and maintain the air supply system, and a confined space, so that the internal configuration of the space will not create entanglement hazards when using air lines, the victim cannot be seen from the outside of the space's primary access opening, the portal size and configuration will not allow a rescuer to pass through the access/egress opening(s) using SCBA when worn in the manner recommended by the manufacturer, all hazards in and around the confined space have been identified and might be mitigated by using respiratory protection so that the rescue entrant passes through the portal without removal of the SAR and the assigned rescue duty is performed.

(A) Requisite Knowledge. Capabilities and limitations of SAR in confined space rescue, breathing air conservation, air-line management and communication methods appropriate to breathing apparatus use in confined spaces.

(B) Requisite Skills. The ability to use SAR in a confined space entry for rescue, use of breathing techniques that will conserve the air supply, manage airlines while working within the space and use of communication methods that effectively convey information between rescuers inside and outside of the space.

- ▲ **7.3.4*** Perform short spinal immobilization of a victim inside a confined space, given a confined space incident requiring spinal precautions, a stable victim, a short spinal immobilization device, a second rescuer to assist, and a confined space, so that the portal size or internal configuration will not allow the application of a full spine immobilization device, all hazards in and around the confined space have been identified and might be mitigated by using respiratory protection so that the victim's cervical spine is manually maintained in a neutral position immediately on contact and maintained until the short immobilization device is completely applied and secure, victim movement onto the spinal immobilization device creates minimal manipulation of the spine, void spaces between the victim and immobilization device are padded as appropriate, victim securement to the immobilization device will reduce spinal manipulation during movement, and applicable local treatment protocols are followed.

(A) Requisite Knowledge. Capabilities and limitations of short spine immobilization equipment for victims in confined space rescue, methods for movement of a victim onto a long spine immobilizer with minimum spinal manipulation, methods for securement of a victim onto a short spine immobilizer, methods for securement of a victim's head on a short spine immobilizer, and other short spinal immobilization treatment modalities and procedures.

(B) Requisite Skills. The ability to maintain manual immobilization of a victim's head during the immobilization process, assist in moving the victim to a short spine immobilizer with only two persons with minimal spinal manipulation, apply void space padding as needed based on the immobilization device, and apply and secure the victim's upper body and head to a short spinal immobilization device.

- ▲ **7.3.5** Prepare for entry into the confined space with a hazardous atmosphere, given a confined space with a hazardous atmosphere, atmosphere-supplied respirators, and a confined

space tool kit, so that entry can be made into a confined space that contains one or more of the following characteristics: the internal configuration of the space could create entanglement hazards and retrieval might not be effective, the victim cannot be seen from the outside of the space's primary access opening, the portal size and configuration will not allow a rescuer to pass through the access/egress opening(s) using SCBA when worn in the manner recommended by the manufacturer, all hazards in and around the confined space have been identified and can be mitigated by using respiratory protection so that continuous atmospheric monitoring is initiated, the atmosphere is assessed to be manageable with atmosphere-supplying respirators, victim communication is established when possible, atmosphere-supplying respirators are used by rescue entrants while within the space, atmosphere-supplying respirators are rapidly applied to the victim, rescuer readiness is verified, rescuers' limitations are identified and evaluated, rescuers unsuitable to entry operations are reassigned and replaced, route and methods of confined space entry are determined, and rescuer evacuation is planned.

(A) Requisite Knowledge. Effects of hazardous atmospheres on victims and rescuers, types and operation of required hazard-specific monitoring equipment, types and operation of required atmosphere supplying respirators, organization protocol for medical and psychological evaluation related to confined space entry, methods of entry into confined spaces with hazardous atmospheres in accordance with operational protocols, and rescuer evaluation methods.

(B) Requisite Skills. The ability to operate monitoring equipment, perform rescuer pre-entry medical exam, evaluate rescuer capabilities and limitations, identify victim communication needs, evaluate for point and route of confined space entry, and select evacuation methods.

- ▲ **7.3.6** Enter a confined space with atmospheric hazards, given hazard-specific PPE; safety, communication, and operational protocols; a confined space with a hazardous atmosphere; a confined space rescue tool kit so that the victim is contacted; and a confined space, so that the internal configuration of the space could create entanglement hazards and retrieval might not be effective, the victim cannot be seen from the outside of the space's primary access opening, the portal size and configuration will not allow a rescuer to pass through the access/egress opening(s) using SCBA when worn in the manner recommended by the manufacturer, all hazards in and around the confined space have been identified and can be mitigated by using respiratory protection so that a controlled confined space entry is established and maintained, the atmosphere is continuously monitored, the rescuers and patient(s) are protected from the hazards, the victim's mental and physical conditions are further assessed, patient care is initiated, the patient is packaged to restrictions of the space, and patient removal can be initiated.

(A) Requisite Knowledge. Principles of operation for atmospheric monitoring equipment; methods for patient care in confined spaces; application of hazard-specific PPE; safety, communication, medical, and operational protocols; and controlled confined space entry and egress procedures for confined spaces.

(B) Requisite Skills. The ability to use and apply hazard-specific PPE and rescue-related systems and equipment; implement safety, communication, and operational protocols; use medical protocols to determine treatment priorities; use medi-

cal equipment specific to confined space victim needs; and reassess and confirm mode of operation.

Chapter 8 Common Passenger Vehicle Rescue

8.1 Awareness Level. Prior to qualification at the awareness level in common passenger vehicle rescue, the individual shall meet the requirements defined in Section 8.1.

8.1.1 Establish scene safety zones, given a common passenger vehicle incident, scene security barriers, incident location, incident information, and personal protective equipment (PPE), so that the scene and responders are visible to approaching common passenger vehicles, safety zones are designated, zone perimeters are consistent with incident requirements, perimeter markings can be recognized and understood by others, zone boundaries are communicated to incident command, and traffic flow is controlled.

(A) Requisite Knowledge. Use and selection of PPE, zone or area control flow and concepts, types of control devices and tools, types of existing and potential hazards, methods of hazard mitigation, organizational standard operating procedure, and staffing requirements.

(B) Requisite Skills. The ability to select and use PPE, apply crowd control concepts, position zone control devices, identify and mitigate existing or potential hazards, and maintain personal safety techniques.

8.1.2 Size up an incident, given an incident, background information and applicable reference materials, so that the operational mode is defined, resource availability and response time, types of rescues are determined, the number of victims are identified, the last reported location of all victims are established, witnesses and reporting parties are identified and interviewed, resource needs are assessed, search parameters are identified, and information required to develop an incident action plan is obtained.

(A) Requisite Knowledge. Types of reference materials and their uses, risk benefit assessment, availability and capability of the resources, elements of an action plan and related information, relationship of size-up to the incident management system, and information gathering techniques and how that information is used in the size-up process.

(B) Requisite Skills. The ability to read specific rescue reference materials, interview and gather information, relay information, manage witnesses, and use information sources.

8.1.3 Recognize incident hazards and initiate isolation procedures, given scene control barriers, personal protective equipment (PPE), requisite equipment, and available specialized resources, so that all hazards are identified; resource application fits the operational requirements; hazard isolation is considered; risks to rescuers, bystanders, and victims are minimized; and rescue time constraints are taken into account.

(A) Requisite Knowledge. Resource capabilities and limitations; types and nature of incident hazards; equipment types and their use; isolation terminology, methods, equipment, and implementation; operational requirement concerns; common types of rescuer and victim risks; risk/benefit analysis methods and practices; hazard recognition, isolation methods, and terminology; methods for controlling access to the scene; and types of technical references.

(B) Requisite Knowledge. The ability to identify resource capabilities and limitations, identify incident hazards, assess potential hazards to rescuers and bystanders, place scene control barriers, and operate control and mitigation equipment.

8.1.4 Recognize the need for technical rescue resources at an operations- or technician-level incident, given AHJ guidelines, so that the need for additional resources is identified, the response system is initiated, the scene is secured and rendered safe until additional resources arrive, and awareness-level personnel are incorporated into the operational plan.

(A) Requisite Knowledge. Operational protocols, specific planning forms, types of incidents common to the AHJ, hazards, incident support operations and resources, and safety measures.

(B) Requisite Skills. The ability to apply operational protocols, select specific planning forms based on the types of incidents, identify and evaluate various types of hazards within the AHJ, request support and resources, and determine the required safety measures.

8.1.5 Support an operations- or technician-level incident, given an incident, an assignment, an incident action plan, and resources from the tool kit, so that the assignment is carried out, progress is reported to command, environmental concerns are managed, personnel rehabilitation is facilitated, and the incident action plan is supported.

(A) Requisite Knowledge. AHJ operational protocols, hazard recognition, incident management, PPE selection, resource selection and use, and scene support requirements.

(B) Requisite Skills. The ability to apply operational protocols, function within an incident management system, follow and implement an incident action plan, and report the task progress status to a supervisor or incident command.

8.2 Operations Level. The job performance requirements defined in Sections 8.1 and 8.2 shall be met prior to or during operations-level qualification in common passenger vehicle rescue.

8.2.1 Create an incident action plan for a common passenger vehicle incident, given agency guidelines, planning forms, and an operations-level common passenger vehicle incident or simulation, so that a standard approach is used during training and operational scenarios, emergency situation hazards are identified, isolation methods and scene security measures are considered, fire suppression and safety measures are identified, common passenger vehicle stabilization needs are evaluated, and resource needs are identified and documented for future use.

(A) Requisite Knowledge. Operational protocols, specific planning forms, types of common passenger vehicles within the AHJ boundaries, common passenger vehicle hazards, incident support operations and resources, common passenger vehicle anatomy, and fire suppression and safety measures.

(B) Requisite Skills. The ability to apply operational protocols, select specific planning forms based on the types of common passenger vehicles, identify and evaluate various types of common passenger vehicles within the AHJ boundaries, request support and resources, identify common passenger vehicle anatomy, and determine the required fire suppression and safety measures.

8.2.2* Establish fire protection, given an extrication incident and fire control support, so that fire and explosion potential is managed and fire hazards and rescue objectives are communicated to the fire support team.

(A) Requisite Knowledge. Types of fire and explosion hazards, incident management system, types of extinguishing devices, agency policies and procedures, types of flammable and combustible substances and types of ignition sources, and extinguishment or control options.

(B) Requisite Skills. The ability to identify fire and explosion hazards, operate within the incident management system, use extinguishing devices, apply fire control strategies, and manage ignition potential.

8.2.3* Stabilize a common passenger vehicle that has come to rest on its wheels on the road surface or similar flat stable environment, given a common passenger vehicle tool kit and PPE, so that the common passenger vehicle is prevented from moving during the rescue operations; entry, exit, and tool placement points are not compromised; anticipated rescue activities will not compromise common passenger vehicle stability; selected stabilization points are structurally sound; stabilization equipment can be monitored; and the risk to rescuers is minimized.

(A) Requisite Knowledge. Types and rated capacities of stabilization devices, mechanism of common passenger vehicle movement, types of stabilization points, types of stabilization surfaces, AHJ policies and procedures, and types of vehicle construction components as they apply to stabilization.

(B) Requisite Skills. The ability to select, operate, and monitor stabilization devices.

8.2.4* Manage potentially harmful energy sources, including propulsion power, restraint systems, and construction materials, given a common passenger vehicle, common passenger vehicle tool kit, and PPE, so that all hazards are identified and isolated, systems are managed, beneficial system use is evaluated, and hazards to rescue personnel and victims are minimized.

(A) Requisite Knowledge. Types and uses of PPE, types of energy sources, system isolation methods, specialized system features, tools for disabling hazards, and policies and procedures of the AHJ.

(B) Requisite Skills. The ability to select and use hazard-specific PPE, identify hazards, operate beneficial systems in support of tactical objectives, and operate tools and devices for securing and disabling hazards.

8.2.5 Determine the common passenger vehicle access and egress points, given the structural and damage characteristics and potential victim location(s), so that the victim location(s) is identified; access and egress points for victims, rescuers, and equipment are designated; flows of personnel, victim, and equipment are identified; existing entry points are used; time constraints are factored; selected entry and egress points do not compromise vehicle stability; chosen points can be protected; equipment and victim stabilization are initiated; and AHJ safety and emergency procedures are enforced.

(A) Requisite Knowledge. Common passenger vehicle construction/features, access and egress points, routes and hazards operating systems, AHJ standard operating procedure, and emergency evacuation and safety signals.

(B) Requisite Skills. The ability to identify access and egress points and probable victim locations, and to assess and evaluate impact of vehicle stability on the victim.

8.2.6 Create access and egress openings for rescue from a common passenger vehicle on its wheels, given a vehicle tool kit, specialized tools and equipment, PPE, and an assignment, so that the movement of rescuers and equipment complements victim care and removal, an emergency escape route is provided, the technique chosen is expedient, victim and rescuer protection is afforded, and vehicle stability is maintained.

(A) Requisite Knowledge. Common passenger vehicle construction and features; electrical, mechanical, hydraulic, pneumatic, and alternative access and egress equipment; points and routes of ingress and egress; techniques and hazards; agency policies and procedures; and emergency evacuation and safety signals.

(B) Requisite Skills. The ability to identify common passenger vehicle construction features, select and operate tools and equipment, apply tactics and strategy based on assignment, apply victim care and stabilization devices, perform hazard control based on techniques selected, and demonstrate safety procedures and emergency evacuation signals.

8.2.7 Disentangle victim(s), given an operations-level extrication incident, a vehicle tool kit, PPE, and specialized equipment, so that undue victim injury is prevented; victim protection is provided; and stabilization is maintained.

(A) Requisite Knowledge. Tool selection and application, stabilization systems, protection methods, disentanglement points and techniques, and dynamics of disentanglement.

(B) Requisite Skills. The ability to operate disentanglement tools, initiate protective measures, identify and eliminate points of entrapment, and maintain incident stability and scene safety.

8.2.8 Remove a packaged victim to a designated safe area, as a member of a team, given a victim transfer device, a designated egress route, and PPE, so that the team effort is coordinated, the designated egress route is used, the victim is removed without compromising victim packaging, undue injury is prevented, and stabilization is maintained.

Δ (A) Requisite Knowledge. Patient handling techniques; types of immobilization, packaging, and transfer devices; types of immobilization techniques; signs and symptoms of compartment syndrome as a result of crush injuries; and uses of immobilization devices.

(B) Requisite Skills. Use of immobilization, packaging, and transfer devices for specific situations; immobilization techniques; application of medical protocols and safety features to immobilize, package, and transfer; and all techniques for lifting the patient.

8.2.9* Terminate a vehicle incident, given PPE specific to the incident, isolation barriers, and an extrication tool kit, so that rescuers and bystanders are protected during termination operations; the party responsible for the operation, maintenance, or removal of the affected vehicle is notified of any modification or damage created during the extrication process; scene control is transferred to a responsible party; potential or existing hazards are communicated to that responsible party; and command is terminated.

(A) Requisite Knowledge. PPE characteristics, hazard and risk identification, isolation techniques, statutory requirements identifying responsible parties, accountability system use, reporting methods, post incident analysis techniques.

Δ (B) Requisite Skills. Selection and use of hazard-specific PPE, decontamination, use of barrier protection techniques, data collection and record keeping/reporting protocols, post incident analysis activities.

Δ 8.3 Technician Level. The job performance requirements defined in Sections 8.2 and 8.3 shall be met prior to or during technician-level qualification in common passenger vehicle rescue.

8.3.1 Create an incident action plan for an incident where a common passenger vehicle has come to rest on its roof, given agency guidelines, planning forms, and a technician-level vehicle incident or simulation, so that a standard approach is used during training and operational scenarios, emergency situation hazards are identified, isolation methods and scene security measures are considered, fire suppression and safety measures are identified, vehicle stabilization needs are evaluated, and resource needs are identified and documented for future use.

(A) Requisite Knowledge. Operational protocols, specific planning forms, types of common passenger vehicles within the AHJ boundaries, vehicle hazards, incident support operations and resources, vehicle anatomy, and fire suppression and safety measures.

Δ (B) Requisite Skills. The ability to apply operational protocols, select specific planning forms based on the position of the common passenger vehicle, identify and evaluate various types of vehicles within the AHJ boundaries, request support and resources, identify common passenger vehicles anatomy, and determine the required fire suppression and safety measures.

8.3.2 Stabilize a common passenger vehicle that has come to rest on its roof, given a common passenger vehicle, a technician-level common passenger vehicle incident or simulation, given a common passenger vehicle tool kit and PPE, so that the common passenger vehicle is prevented from moving during the rescue operations; entry, exit, and tool placement points are not compromised; anticipated rescue activities will not compromise common passenger vehicle stability; selected stabilization points are structurally sound; stabilization equipment can be monitored; and the risk to rescuers is minimized.

(A) Requisite Knowledge. Types and rated capacities of stabilization devices, mechanism of common passenger vehicle movement, types of stabilization points, types of stabilization surfaces, AHJ policies and procedures, and types of common passenger vehicle construction components as they apply to stabilization.

(B) Requisite Skills. The ability to select, operate, and monitor stabilization devices.

8.3.3 Create access and egress openings for rescue from a common passenger vehicle that has come to rest on its roof, given a technician-level common passenger vehicle incident or simulation, a common passenger vehicle tool kit, specialized tools and equipment, PPE, and an assignment, so that the movement of rescuers and equipment complements victim care and removal, an emergency escape route is provided, the technique chosen is expedient, victim and rescuer protection is

afforded, and common passenger vehicle stability is maintained.

(A) Requisite Knowledge. Common passenger vehicle construction and features; electrical, mechanical, hydraulic, and pneumatic systems; alternative access and egress equipment; points and routes of ingress and egress; techniques and hazards; agency policies and procedures; and emergency evacuation and safety signals.

(B) Requisite Skills. The ability to identify common passenger vehicle construction features, select and operate tools and equipment, apply tactics and strategy based on assignment, apply victim care and stabilization devices, perform hazard control based on techniques selected, and demonstrate safety procedures and emergency evacuation signals.

N 8.3.4 Create an incident action plan for an incident where a common passenger vehicle has come to rest on its side, given agency guidelines, planning forms, and a technician-level common passenger vehicle incident or simulation, so that a standard approach is used during training and operational scenarios, emergency situation hazards are identified, isolation methods and scene security measures are considered, fire suppression crew and safety measures are identified, common passenger vehicle stabilization needs are evaluated, and resource needs are identified and documented for future use.

N (A) Requisite Knowledge. Operational protocols, specific planning forms, common passenger vehicle to the AHJ boundaries, common passenger vehicle hazards, incident support operations and resources, common passenger vehicle anatomy, and fire suppression crew and safety measures.

N (B) Requisite Skills. The ability to apply operational protocols, select specific planning forms based on the position of the common passenger vehicle, identify and evaluate various types of common passenger vehicle within the jurisdiction of the AHJ, request support and resources, and determine the required fire suppression crew and safety measures.

N 8.3.5 Stabilize a common passenger vehicle that has come to rest on its side, given a common passenger vehicle tool kit and PPE, so that the common passenger vehicle is prevented from moving during the rescue operations; entry, exit, and tool placement points are not compromised; anticipated rescue activities will not compromise common passenger vehicle stability; selected stabilization points are structurally sound; stabilization equipment can be monitored; and the risk to rescuers is minimized.

N (A) Requisite Knowledge. Types of stabilization devices, mechanism of vehicle movement, types of stabilization points, types of stabilization surfaces, AHJ policies and procedures, and types of vehicle construction components as they apply to stabilization.

N (B) Requisite Skills. The ability to select, operate, and monitor stabilization devices.

N 8.3.6 Create access and egress openings for rescue from a common passenger vehicle that has come to rest on its side, given a common passenger vehicle tool kit, specialized tools and equipment, PPE, and an assignment, so that the movement of rescuers and equipment complements victim care and removal, an emergency escape route is provided, the technique chosen is expedient, victim and rescuer protection is afforded, and common passenger vehicle stability is maintained.

(A) Requisite Knowledge. Common passenger vehicle construction and features; electrical, mechanical, hydraulic, and pneumatic systems; alternative access and egress equipment; points and routes of ingress and egress; techniques and hazards; agency policies and procedures; and emergency evacuation and safety signals.

(B) Requisite Skills. The ability to identify common passenger vehicle construction features, select and operate tools and equipment, apply tactics and strategy based on assignment, apply victim care and stabilization devices, perform hazard control based on techniques selected, and demonstrate safety procedures and emergency evacuation signals.

8.3.7 Create an incident action plan for an incident where a common passenger vehicle has come to rest in a configuration or environment where multiple concurrent hazards must be managed to access or remove the occupants, given agency guidelines, planning forms, and a technician-level common passenger vehicle incident or simulation, so that a standard approach is used during training and operational scenarios, emergency situation hazards are identified, isolation methods and scene security measures are considered, fire suppression and safety measures are identified, common passenger vehicle stabilization needs are evaluated, and resource needs are identified and documented for future use.

(A) Requisite Knowledge. Operational protocols, specific planning forms, common passenger vehicle hazards, incident support operations and resources, vehicle anatomy, and fire suppression and safety measures.

(B) Requisite Skills. The ability to apply operational protocols, select specific planning forms based on the position of the common passenger vehicle, identify and evaluate various types of common passenger vehicles, request support and resources, identify anatomy, and determine the required fire suppression crew and safety measures.

8.3.8 Stabilize a common passenger vehicle that has come to rest in a configuration or environment where multiple concurrent hazards must be managed to access or remove the occupants, given a vehicle tool kit and PPE, so that the vehicle is prevented from moving during the rescue operations; entry, exit, and tool placement points are not compromised; anticipated rescue activities will not compromise vehicle stability; selected stabilization points are structurally sound; stabilization equipment can be monitored; and the risk to rescuers is minimized.

(A) Requisite Knowledge. Types of stabilization devices, mechanism of vehicle movement, types of stabilization points, types of stabilization surfaces, AHJ policies and procedures, and types of vehicle construction components as they apply to stabilization.

(B) Requisite Skills. The ability to select, operate, and monitor stabilization devices.

8.3.9 Disentangle victim(s), given an extrication incident, a vehicle tool kit, PPE, and specialized equipment, so that undue victim injury is prevented, victim protection is provided, and stabilization is maintained.

(A) Requisite Knowledge. Tool selection and application, stabilization systems, protection methods, disentanglement points and techniques, and dynamics of disentanglement.

(B) Requisite Skills. The ability to operate disentanglement tools, initiate protective measures, identify and eliminate points of entrapment, and maintain incident stability and scene safety.

Chapter 9 Heavy Vehicle Rescue

9.1 Awareness Level. Prior to qualification at the awareness level in heavy vehicle rescue, the individual shall meet the requirements in Section 9.1.

9.1.1 Size up a heavy vehicle rescue incident, given background information and applicable reference materials, so that the scope of the rescue is determined, the number of victims is identified, the last reported location of all the victims is established, witnesses and reporting parties are identified and interviewed, resource needs are assessed, primary search parameters are identified, and information required to develop an initial incident action plan is obtained.

(A) Requisite Knowledge. Types of reference materials and their uses, availability and capability of the resources, elements of an incident action plan and related information, relationship of the size-up to the incident management system, information gathering techniques and how that information is used in the size-up process, and basic search criteria for heavy vehicle rescue incidents.

(B) Requisite Skills. The ability to read technical rescue reference materials, gather information, use interview techniques, relay information, and use information-gathering sources.

9.1.2 Recognize incident hazards and initiate isolation procedures, given scene control barriers, personal protective equipment (PPE), requisite equipment, and available specialized resources, so that all the hazards are identified; resource application fits the operational requirements; hazard isolation is considered; risks to rescuers, bystanders, and victims are minimized; and rescue time constraints are taken into account.

(A) Requisite Knowledge. Resource capabilities and limitations; types and nature of incident hazards; equipment types and their use; isolation terminology, methods, equipment, and implementation; operational requirement concerns; common types of rescuer and victim risks; risk/benefit analysis methods and practices; hazard recognition, isolation methods, and terminology; methods for controlling access to the scene; and types of technical references.

(B) Requisite Skills. The ability to identify resource capabilities and limitations, identify incident hazards, assess potential hazards to rescuers and bystanders, place scene control barriers, and operate control and mitigation equipment.

9.1.3 Recognize the need for technical rescue resources at an operations- or technician-level incident, given AHJ guidelines, so that the need for additional resources is identified, the response system is initiated, the scene is secured and rendered safe until additional resources arrive, and awareness-level personnel are incorporated into the operational plan.

(A) Requisite Knowledge. Operational protocols, specific planning forms, types of incidents common to the AHJ, hazards, incident support operations and resources, and safety measures.

- N (B) Requisite Skills.** The ability to apply operational protocols, select specific planning forms based on the types of incidents, identify and evaluate various types of hazards within the AHJ, request support and resources, and determine the required safety measures.
- N 9.1.4** Support an operations- or technician-level incident, given an incident, an assignment, an incident action plan, and resources from the tool kit, so that the assignment is carried out, progress is reported to command, environmental concerns are managed, personnel rehabilitation is facilitated, and the incident action plan is supported.
- N (A) Requisite Knowledge.** AHJ operational protocols, hazard recognition, incident management, PPE selection, resource selection and use, and scene support requirements.
- N (B) Requisite Skills.** The ability to apply operational protocols, function within an incident management system, follow and implement an incident action plan, and report the task progress status to a supervisor or incident command.
- N 9.2 Operations Level.** The job performance requirements defined in Sections 8.3, 9.1, and 9.2 shall be met prior to or during operations-level qualification in heavy vehicle rescue.
- N 9.2.1** Create an incident action plan for a heavy vehicle incident, and conduct an initial and ongoing size-up, given agency guidelines, planning forms, and an operations-level vehicle incident or simulation, so that a standard approach is used during training and operational scenarios, emergency situation hazards are identified, isolation methods and scene security measures are considered, fire suppression and safety measures are identified, vehicle stabilization needs are evaluated, and resource needs are identified and documented for future use.
- N (A) Requisite Knowledge.** Operational protocols, specific planning forms, types of vehicles common to the AHJ boundaries, vehicle hazards, incident support operations and resources, vehicle anatomy, and fire suppression and safety measures.
- N (B) Requisite Skills.** The ability to apply operational protocols, select specific planning forms based on the types of vehicles, identify and evaluate various types of vehicles within the AHJ boundaries, request support and resources, identify vehicle anatomy, and determine the required fire suppression and safety measures.
- N 9.2.2** Establish fire protection, given an extrication incident and fire control support, so that fire and explosion potential is managed and fire hazards and rescue objectives are communicated to the fire suppression crew.
- N (A) Requisite Knowledge.** Types of fire and explosion hazards, incident management systems, types of extinguishing devices, agency policies and procedures, types of flammable and combustible substances and types of ignition sources, and extinguishment or control options.
- N (B) Requisite Skills.** The ability to identify fire and explosion hazards, operate within the incident management system, use extinguishing devices, apply fire control strategies, and manage ignition potential.
- N 9.2.3** Stabilize a heavy vehicle that has come to rest in its position of use on the road or other stable surface, given a vehicle tool kit and PPE, so that the vehicle is prevented from moving during the rescue operations; entry, exit, and tool placement points are not compromised; anticipated rescue activities will not compromise vehicle stability; selected stabilization points are structurally sound; stabilization equipment can be monitored; and the risk to rescuers is minimized.
- N (A) Requisite Knowledge.** Types and rated capacities of stabilization devices, mechanism of heavy vehicle movement, types of stabilization points, types of stabilization surfaces, AHJ policies and procedures, and types of vehicle construction components as they apply to stabilization.
- N (B) Requisite Skills.** The ability to select, operate, and monitor stabilization devices.
- N 9.2.4** Isolate potentially harmful energy sources, including propulsion power, restraint systems, and construction materials, given a heavy vehicle, vehicle tool kit, and PPE, so that all hazards are identified, systems are managed, beneficial system use is evaluated, and hazards to rescue personnel and victims are minimized.
- N (A) Requisite Knowledge.** Types and uses of PPE, types of energy sources, system isolation methods, specialized system features, tools for disabling hazards, and policies and procedures of the AHJ.
- N (B) Requisite Skills.** The ability to select and use hazard-specific PPE, identify hazards, operate beneficial systems in support of tactical objectives, and operate tools and devices for securing and disabling hazards.
- N 9.2.5** Determine the heavy vehicle access and egress points, given the structural and damage characteristics and potential victim location(s), so that the victim location(s) is identified; access and egress points for victims, rescuers, and equipment are designated; flows of personnel, victims, and equipment are identified; existing entry points are used; time constraints are factored; selected entry and egress points do not compromise vehicle stability; chosen points can be protected; equipment and victim stabilization are initiated; and AHJ safety and emergency procedures are followed.
- N (A) Requisite Knowledge.** Heavy vehicle construction/features, access and egress points, routes and hazards operating systems, AHJ standard operating procedure, and emergency evacuation and safety signals.
- N (B) Requisite Skills.** The ability to identify access and egress points and probable victim locations, and to assess and evaluate impact of vehicle stability on the victim.
- N 9.2.6** Create access and egress openings for rescue from a heavy vehicle on its wheels given a vehicle tool kit, specialized tools and equipment, PPE, and an assignment, so that the movement of rescuers and equipment complements victim care and removal, an emergency escape route is provided, the technique chosen is expedient, victim and rescuer protection is afforded, and vehicle stability is maintained.
- N (A) Requisite Knowledge.** Heavy vehicle construction and features; electrical, mechanical, hydraulic, pneumatic, and alternative access and egress equipment; points and routes of ingress and egress; techniques and hazards; agency policies and procedures; and emergency evacuation and safety signals.
- N (B) Requisite Skills.** The ability to identify heavy vehicle construction features, select and operate tools and equipment, apply tactics and strategy based on assignment, apply victim care and stabilization devices, perform hazard control based on

techniques selected, and demonstrate safety procedures and emergency evacuation signals.

N 9.2.7 Disentangle victim(s), given an extrication incident, a vehicle tool kit, PPE, and specialized equipment, so that undue victim injury is prevented, victim protection is provided, and stabilization is maintained.

N (A) Requisite Knowledge. Tool selection and application, stabilization systems, protection methods, disentanglement points and techniques, and dynamics of disentanglement.

N (B) Requisite Skills. The ability to operate disentanglement tools, initiate protective measures, identify and eliminate points of entrapment, and maintain incident stability and scene safety.

N 9.2.8 Remove a packaged victim to a designated safe area, as a member of a team, given a victim transfer device, a designated egress route, and PPE, so that the team effort is coordinated, the designated egress route is used, the victim is removed without compromising victim packaging, undue injury is prevented, and stabilization is maintained.

N (A) Requisite Knowledge. Patient handling techniques; types of immobilization, packaging, and transfer devices; types of immobilization techniques; and uses of immobilization devices.

N (B) Requisite Skills. Use of immobilization, packaging, and transfer devices for specific situations; immobilization techniques; application of medical protocols and safety features to immobilize, package, and transfer; and all techniques for lifting the patient.

N 9.2.9 Terminate a heavy vehicle incident, given PPE specific to the incident, isolation barriers, and an extrication tool kit, so that rescuers and bystanders are protected during termination operations; the party responsible for the operation, maintenance, or removal of the affected vehicle is notified of any modification or damage created during the extrication process; scene control is transferred to a responsible party; potential or existing hazards are communicated to that responsible party; and command is terminated.

N (A) Requisite Knowledge. PPE characteristics, hazard and risk identification, isolation techniques, statutory requirements identifying responsible parties, accountability system use, reporting methods, postincident analysis techniques.

N (B) Requisite Skills. Selection and use of hazard-specific PPE; decontamination of PPE; use of barrier protection techniques, data collection and record keeping/reporting protocols, and postincident analysis activities.

N 9.3 Technician Level. The job performance requirements defined in Sections 9.2 and 9.3 shall be met prior to or during technician-level qualification in heavy vehicle rescue.

N 9.3.1 Create an incident action plan for an incident where a heavy vehicle has come to rest in a configuration or environment where multiple concurrent hazards must be managed to access or remove the occupants, given agency guidelines, planning forms, and a technician-level vehicle incident or simulation, so that a standard approach is used during training and operational scenarios, emergency situation hazards are identified, isolation methods and scene security measures are considered, fire suppression and safety measures are identified, vehicle stabilization needs are evaluated, and resource needs are identified and documented for future use.

N (A) Requisite Knowledge. Operational protocols, specific planning forms, common heavy vehicles, heavy vehicle hazards, incident support operations and resources, heavy vehicle anatomy, and fire suppression and safety measures.

N (B) Requisite Skills. The ability to apply operational protocols, select specific planning forms based on the position of the heavy vehicle, identify and evaluate various types of common heavy vehicles, request support and resources, identify commercial/heavy vehicles anatomy, and determine the required fire suppression and safety measures.

N 9.3.2 Stabilize a heavy vehicle that has come to rest in a configuration or environment where multiple concurrent hazards must be managed to access or remove the occupants, given a vehicle and machinery tool kit and PPE, so that the vehicle is prevented from moving during the rescue operations; entry, exit, and tool placement points are not compromised; anticipated rescue activities will not compromise vehicle stability; selected stabilization points are structurally sound; stabilization equipment can be monitored; and the risk to rescuers is minimized.

N (A) Requisite Knowledge. Types and rated capacities of stabilization devices, mechanism of vehicle movement, types of stabilization points, types of stabilization surfaces, AHJ policies and procedures, and types of heavy vehicle construction components as they apply to stabilization.

N (B) Requisite Skills. The ability to select, operate, and monitor stabilization devices on heavy vehicles.

N 9.3.3 Lift a heavy vehicle, given a heavy vehicle incident, a vehicle tool kit and PPE, so that unanticipated movement is prevented during the rescue operations; entry, exit, and tool placement points are not compromised; anticipated rescue activities will not compromise vehicle stability; selected lift points are structurally sound; lifting equipment can be monitored; and the risk to rescuers is minimized.

N (A) Requisite Knowledge. Types of lifting devices, mechanism of vehicle movement, types of lifting points, types of lifting surfaces, types of cribbing, AHJ policies and procedures, and types of vehicle construction components as they apply to lifting.

N (B) Requisite Skills. The ability to deploy and operate lifting devices, ability to deploy cribbing, recognition of competent lift points, calculation of weights and center of gravity, assessment of vehicle stability, use of tools or systems to prevent unwanted movement.

N 9.3.4 Coordinate the use of heavy equipment as a part of a plan to lift, move, or stabilize a heavy vehicle, given a heavy vehicle incident, heavy equipment and an operator, a vehicle tool kit, and PPE, so that the objective is met and the risks to the responders are minimized.

N (A) Requisite Knowledge. Methods of requesting heavy equipment, methods of communication, use of rigging.

N (B) Requisite Skills. The ability to determine estimated weights to be moved or lifted and perform coordinated integrated lifting or moving operations utilizing heavy equipment.

N 9.3.5 Create access and egress openings for rescue from a heavy vehicle that has come to rest in a configuration or environment where multiple concurrent hazards must be managed to access or remove the occupants, given a vehicle tool kit,

specialized tools and equipment, PPE, and an assignment, so that the movement of rescuers and equipment complements victim care and removal, an emergency escape route is provided, the technique chosen is expedient, victim and rescuer protection is afforded, and vehicle stability is maintained.

(A) Requisite Knowledge. Heavy vehicle construction and features; electrical, mechanical, hydraulic, pneumatic, and alternative access and egress equipment; points and routes of ingress and egress; techniques and hazards; agency policies and procedures; and emergency evacuation and safety signals.

(B) Requisite Skills. The ability to identify heavy vehicle construction features, select and operate tools and equipment, apply tactics and strategy based on assignment, apply victim care and stabilization devices, perform hazard control based on techniques selected, and demonstrate safety procedures and emergency evacuation signals.

9.3.6 Disentangle victim(s) from a heavy vehicle that has come to rest in a configuration or environment where multiple concurrent hazards must be managed to access or remove the occupants, given a heavy vehicle extrication incident, a vehicle tool kit, PPE, and specialized equipment, so that undue victim injury is prevented, victim protection is provided, and stabilization is maintained.

(A) Requisite Knowledge. Tool selection and application, stabilization systems, protection methods, disentanglement points and techniques, and dynamics of disentanglement.

(B) Requisite Skills. The ability to operate disentanglement tools, initiate protective measures, identify and eliminate points of entrapment, and maintain incident stability and scene safety.

9.3.7 Remove a packaged victim to a designated safe area, as a member of a team from a heavy vehicle that has come to rest in a configuration or environment where multiple concurrent hazards must be managed to access or remove the occupants, given a victim transfer device, a designated egress route, and PPE, so that the team effort is coordinated, the designated egress route is used, the victim is removed without compromising victim packaging, undue injury is prevented, compartment syndrome due to crush injuries is managed, and stabilization is maintained.

(A) Requisite Knowledge. Patient handling techniques; incident management system; types of immobilization, packaging, and transfer devices; types of immobilization techniques; and uses of immobilization devices.

(B) Requisite Skills. Use of immobilization, packaging, and transfer devices for specific situations; immobilization techniques; application of medical protocols and safety features to immobilize, package, and transfer; and all techniques for lifting the patient.

Chapter 10 Animal Technical Rescue

10.1 Awareness Level. Prior to qualification at the awareness level in animal technical rescue, the individual shall meet the requirements defined in Section 10.1.

10.1.1 Size up an animal technical rescue incident, given background information and applicable reference materials, so that the scope of the rescue is determined, the number of animals is identified, the last reported location of all the animals is established, witnesses and reporting parties are identified and inter-

viewed, resource needs are assessed, primary search parameters are identified, and information required to develop an initial incident action plan is obtained.

(A) Requisite Knowledge. Types of reference materials and their uses, availability and capability of the resources, elements of an incident action plan and related information, relationship of the size-up to the incident management system, information gathering techniques and how that information is used in the size-up process, and basic search criteria for animal technical rescue incidents.

(B) Requisite Skills. The ability to read technical rescue reference materials, gather information, use interview techniques, relay information, and use information-gathering sources.

10.1.2 Recognize incident hazards and initiate isolation procedures, given scene control barriers, personal protective equipment (PPE), requisite equipment, and available specialized resources, so that all hazards are identified; resource application fits the operational requirements; hazard isolation is considered; risks to rescuers, bystanders, and animals are minimized; and rescue time constraints are taken into account.

(A) Requisite Knowledge. Resource capabilities and limitations; types and nature of incident hazards; equipment types and their use; isolation terminology, methods, equipment, and implementation; operational requirement concerns; common types of rescuer and animal risks; risk/benefit analysis methods and practices; hazard recognition, isolation methods, and terminology; methods for controlling access to the scene; and types of technical references.

(B) Requisite Skills. The ability to identify resource capabilities and limitations, identify incident hazards, assess potential hazards to rescuers and bystanders, place scene control barriers, and operate control and mitigation equipment.

10.1.3 Recognize the need for technical rescue resources at an operations- or technician-level incident, given AHJ guidelines, so that the need for additional resources is identified, the response system is initiated, the scene is secured and rendered safe until additional resources arrive, and awareness-level personnel are incorporated into the operational plan.

(A) Requisite Knowledge. Operational protocols, specific planning forms, types of incidents common to the AHJ, hazards, incident support operations and resources, and safety measures.

(B) Requisite Skills. The ability to apply operational protocols, select specific planning forms based on the types of incidents, identify and evaluate various types of hazards within the AHJ, request support and resources, and determine the required safety measures.

10.1.4 Support an operations- or technician-level incident, given an incident, an assignment, an incident action plan, and resources from the tool kit, so that the assignment is carried out, progress is reported to command, environmental concerns are managed, personnel rehabilitation is facilitated, and the incident action plan is supported.

(A) Requisite Knowledge. AHJ operational protocols, hazard recognition, incident management, PPE selection, resource selection and use, and scene support requirements.

(B) Requisite Skills. The ability to apply operational protocols, function within an incident management system, follow

and implement an incident action plan, and report the task progress status to a supervisor or incident command.

- **10.2 Operations-Level General Requirements.** The job performance requirements defined in Sections 5.2, 10.1, and 10.2 shall be met prior to or during operations-level qualification in animal technical rescue.

10.2.1 Recognize basic animal handling and behavior principles, given a representative animal, so that the incident is managed, risks to rescuers are minimized, and risks to the animal are minimized.

(A) Requisite Knowledge. Hazard-specific PPE selection and use, fight/flight behavior principles, and species-specific containment methods and devices.

(B) Requisite Skills. The ability to select and use hazard-specific PPE, apply species-specific handling principles, and identify species-specific behavioral cues.

• **10.2.2*** Stabilize a representative animal, given a first aid kit, and an actual or simulated EMS agency, so that rescuers and a representative animal are protected from hazards, the representative animal's injuries or illnesses are assessed and managed, and the representative animal is delivered to the appropriate EMS provider with information regarding the history of the rescue activity and the representative animal's condition with the assistance of local-policy-determined personnel, when available.

(A) Requisite Knowledge. Animal and scene assessment methods; animal treatment, methods of physical and chemical immobilization, and packaging methods; resource availability; and medical information management and communication methods.

(B) Requisite Skills. The ability to use animal immobilization, packaging, and treatment methods appropriate to the situation and provide animal transfer reports, both verbally and in writing.

10.2.3* Perform basic-level triage, given triage tags and AHJ protocols, so that determination between rescue and recovery modes are made, triage decisions reflect resource capabilities, severity of injuries are determined, and animal care and rescue priorities are established in accordance with local protocol.

(A) Requisite Knowledge. Types and systems of triage according to AHJ protocol, resource availability, methods to determine injury severity, ways to manage resources, and prioritization requirements.

(B) Requisite Skills. The ability to use triage materials, techniques, and resources.

10.2.4 Construct an improvised restraint device, given an available rope or accessory cord, so that the device includes a long enough standing end to ensure rescuer control and that the representative animal is able to be led to a safe area.

(A) Requisite Knowledge. Hazard-specific PPE selection and use, application of knots, animal halter pressure principles, rope or webbing material selection, and device positioning techniques on animals.

- Δ **(B) Requisite Skills.** Select and use hazard-specific PPE, tie knots, construct and rig animal halters, and evaluate correct placement.

10.2.5 Move a representative animal, in a low-angle environment, as a member of a team, given an incident action plan and basic animal transport equipment, so that hazards are identified, the representative animal is moved without further injury, risks to rescuers are managed, the representative animal securement is maintained, and the objective is attained.

- Δ **(A) Requisite Knowledge.** Types of basic animal transport equipment, hazard identification, hazard-specific PPE, methods to reduce and prevent further injuries from the environment and/or species-specific securement methods (physical and chemical), and transport techniques.

(B) Requisite Skills. Operate transport equipment, assemble and operate environment- or hazard-specific animal removal systems, and the use of transport devices.

- Δ **10.2.6** Move a representative animal in a low-angle environment, as a member of a team, given animal transport equipment, litters, and animal removal systems specific to the rescue environment, so that the a representative animal is moved without further injuries, risks to rescuers are minimized from both the hazard and the representative animal, the integrity of a representative animal's securement within the transfer device is established and maintained, the means of attachment to the rope rescue system is maintained, and the representative animal is removed from the hazard.

(A) Requisite Knowledge. Types of transport equipment and removal systems, selection factors with regard to specific rescue environments, methods to reduce and prevent further injuries from the hazard and from the species-specific hazards, types of risks to rescuers to include the hazard as well as species-specific hazards, ways to establish and maintain animal securement (both physical and chemical), transport techniques, rope rigging applications and methods, and types of specialized equipment and their uses.

(B) Requisite Skills. The ability to secure an animal to transport equipment, the ability to assemble and operate environment-specific animal removal systems, and to choose an incident-specific transport device.

- Δ **10.2.7** Maintain rescue equipment, given maintenance logs and records, tools, resources, manufacturer's guidelines, and organizational standard operating procedures, which should include keeping the large animal technical rescue cache subjected to greater than 600 lb (272 kg) loads separate from the regular cache, so that the operational status of equipment is verified and documented, components are checked for operation, deficiencies are repaired or reported as indicated by standard operating procedure, and items subject to replacement protocol are correctly disposed of and changed.

(A) Requisite Knowledge. Functions and operations of rescue equipment, use of record-keeping systems, manufacturer and organizational care and maintenance requirements, selection and use of maintenance tools, replacement protocol and procedures, disposal methods, and organizational standard operating procedures.

(B) Requisite Skills. The ability to identify wear and damage indicators for rescue equipment, evaluate operation readiness of equipment, complete logs and records, and select and use maintenance tools.

- Δ **10.2.8** Move a representative animal load in a high-angle environment, as a member of a team, given animal transport equip-

ment, litters, other specialized equipment, and animal removal systems specific to the rescue environment, so that the representative animal is moved without further injury, risks to rescuers are minimized from both the hazard and the representative animal, the integrity of the representative animal's securement within the transfer device is established and maintained, the means of attachment to the rescue system is maintained, and the representative animal is removed from the hazard.

(A) Requisite Knowledge. Types of transport equipment and removal systems, selection factors with regard to specific rescue environments, methods to reduce and prevent further injuries from the hazard and from the species-specific, types of risks to rescuers to include the hazard as well as species-specific hazards, ways to establish and maintain animal securement (species-specific), transport techniques, rope rigging applications and methods, and types of specialized equipment and their uses.

(B) Requisite Skills. The ability to secure an animal to transport equipment, assemble and operate environment-specific animal removal systems, and choose an incident-specific transport device.

10.2.9 Develop a plan to release a representative animal from soil entrapment, as a member of a team, given an incident, a representative animal load, personal protective equipment, a mud rescue tool kit, and specialized equipment, so that hazards to rescue personnel and a representative animal are minimized; considerations are given to animal hypothermia, dehydration, and other injuries; techniques are used to enhance animal survivability; tasks are accomplished within projected time frames.

(A) Requisite Knowledge. Identification, utilization, and required care of personal equipment; general hazards associated with mud rescue to both the animal and the rescuers to include adhesive forces; selection and application of rescue tools and resources; risk/benefit assessment techniques for extrication methods; and time restraints.

(B) Requisite Skills. The ability to select, use, and care for personal protective equipment, operate rescue tools and stabilization systems, and complete risk/benefit assessments for selected methods of rescue and time restraints.

10.2.10 Develop a plan for an animal transport vehicle incident, given an incident, agency guidelines, and planning forms, so that size-up is conducted and continued throughout the incident; a standard approach is used during training and operational scenarios; hazards are identified; isolation methods and scene security measures are considered; fire suppression and safety measures are identified; vehicle stabilization needs are evaluated; and resource needs, including veterinary personnel, are identified.

(A) Requisite Knowledge. Operational protocols, specific planning forms, types of vehicles common to the AHJ boundaries, vehicle hazards, animal hazards to the rescuers, incident support operations and resources, vehicle anatomy, and fire suppression and safety measures.

(B) Requisite Skills. The ability to apply operational protocols, select specific planning forms based on the types of vehicles, identify and evaluate various types of vehicles within the AHJ boundaries, request support and resources, identify vehicle anatomy, and determine the required fire suppression and safety measures.

10.2.11 Remove a packaged representative animal to a designated safe area, as a member of a team, given an animal transfer device, a designated egress route, and personal protective equipment, so that effort is coordinated, the designated egress routes are used, a representative animal is removed without compromising animal packaging, injury is prevented, and stabilization is maintained.

(A) Requisite Knowledge. Animal handling techniques; incident management system; types of immobilization, packaging, appropriate animal attachment points, and transfer devices; types of immobilization techniques; and uses of immobilization devices.

(B) Requisite Skills. Use of immobilization, packaging, and transfer devices for specific situations; immobilization techniques, including chemical with the assistance of AHJ designated personnel; application of medical protocols and safety features to immobilize, package, and transfer; and all techniques for lifting or moving the animal.

10.2.12* Terminate an incident, given personal protective equipment specific to the incident, isolation barriers, and tool kit, so that rescuers and bystanders are protected and accounted for during termination operations; the party responsible is notified of any modification or damage created during the operational period; documentation of loss or material use is accounted for; scene documentation is performed; scene control is transferred to a responsible party; potential or existing hazards are communicated to that responsible party; debriefing and postincident analysis and critique are considered; and command is terminated.

(A) Requisite Knowledge. PPE characteristics, hazard and risk identification, isolation techniques, statutory requirements identifying responsible parties, accountability system use, reporting methods, postincident analysis techniques.

Δ (B) Requisite Skills. Selection and use of hazard-specific PPE, use of barrier protection techniques, data collection and record keeping/reporting protocols, postincident analysis activities.

N 10.2.13 Interact with a person on the scene who is in an emotional or psychological crisis, given an animal emergency situation, consistent with the mission of the agency, the policies and procedures of the organization, and a person in a crisis scenario so that the condition is recognized and communicated to the team, the rescuer is prevented from harm, and the actions of the rescuer do not escalate the incident.

N (A) Requisite Knowledge. Indicators of a person in emotional crisis, typical triggers that can cause individuals to become agitated or anxious, methods of interacting to prevent harm to the rescuer and the subject, and best practices to de-escalate incidents involving persons in crisis.

N (B) Requisite Skills. Methods of approach that minimize the risk to the rescuer from subjects whose psychological or emotional state is unknown, interview techniques that provide insight to the motives and state of mind of the subject, and communication and interaction with the subject in a manner that does not escalate the incident.

10.2.14* Construct a simple, rope mechanical advantage system, given an incident, representative animal load, an anchor system, life safety rope, carabiners, pulleys, rope grab devices, and rope rescue equipment, so that the system