



Standard Guide for Helicopter Inland Search and Rescue (SAR) Technician¹

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1. Scope

1.1 This guide establishes the minimum training standard for a helicopter inland search and rescue technician (hereafter known as Helicopter SAR Technician) with focus on the general, field, and search and rescue specific knowledge, skills, and abilities needed to function as a member of the crew with a helicopter in support of an inland search and rescue operation.

1.2 This guide is focused on inland, non-oceanic areas of operation, including flood and swiftwater rescue operations.

1.3 This guide is focused on persons functioning as a crewmember with helicopters only; no fixed-winged operations are included.

1.4 General, field, and search and rescue specific knowledge and skills related to inland search and rescue are found in the following referenced ASTM documents: **F1591**, **F1633**, **F1739**, **F1846**, **F2209**, **F2685**, and **F2751**. The training identified in this guide supplements and enhances the search and rescue technician's existing training, knowledge, and skills.

1.5 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:²

F1591 Practice for Visual Signals Between Persons on the Ground and in Aircraft During Ground Emergencies

F1633 Guide for Techniques in Land Search

F1739 Guide for Performance of a Water Rescuer—Level I

F1846 Practice for Symbols and Markings for Use With Land Search Maps

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

F2209 Guide for Training of Level I Land Search Team Member

F2685 Guide for Training of a Land Search Team Leader (STL)

F2751 Guide for Training of Support Level Land Rescue Team Member (LRT-Support) Member

3. Terminology

3.1 Acronyms:

3.1.1 *AGL*—Above Ground Level

3.1.2 *AHJ*—Authority Having Jurisdiction

3.1.3 *ANVIS*—Aviator's Night Vision Imaging System

3.1.4 *CRM*—Crew Resource Management

3.1.5 *FLIR*—Forward Looking Infra-Red

3.1.6 *HEED*—Helicopter Emergency Egress Device

3.1.7 *HELP*—Heat Escape Lessening Posture

3.1.8 *HS*—HeliSpot

3.1.9 *HUET*—Helicopter Underwater Egress

3.1.10 *LZ*—Landing Zone

3.1.11 *PCDS*—Personnel Carrying Device System

3.1.12 *PF*—Personal Flotation Device

3.1.13 *PPE*—Personal Protective Equipment

3.1.14 *SAR*—Search and Rescue

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *altitude, n*—the height expressed in units of distance above a reference plane, usually above mean sea level or above ground level.

3.2.2 *authority having jurisdiction (AHJ), n*—an organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, and installation or procedure.

3.2.3 *crewmember, n*—an individual assigned a duty in a helicopter during flight time.³

3.2.4 *crew resource management (CRM), n*—a method for addressing the challenge of optimizing the human/machine interface and accompanying interpersonal activities to include

³ Aviation Training Glossary, <https://www.iat.gov/Training/pages/online.asp>; 14CFR1.1: FAA Definitions.

activities which may include team building, information sharing, problem solving, decision making, and maintaining situational awareness. CRM is the use of all available resources, information, equipment, and people to achieve safe and efficient flight operations.⁴

3.2.5 *emergency, n*—(a) *life-threatening*—a situation or occurrence of a serious nature, developing suddenly and unexpectedly and demanding immediate action to prevent loss of life. (b) *operational*—an unforeseen combination of circumstances that calls for immediate action, but not life-threatening.

3.2.6 *external load, n*—a load that is carried, or extends, outside of the aircraft fuselage.³

3.2.7 *flightcrew member, n*—means a pilot, flight engineer, or flight navigator assigned to duty in an aircraft during flight time.⁵

3.2.8 *ground visibility, n*—prevailing horizontal visibility near the earth’s surface as reported by the United States National Weather Service or an accredited observer.³

3.2.9 *helicopter, n*—means a rotorcraft that, for its horizontal motion, depends principally on its engine-driven rotors.³

3.2.10 *helicopter SAR crew chief, n*—an individual responsible for all operations and equipment starting from behind the flight deck within the helicopter and under the supervision of the pilot or co-pilot.

3.2.11 *helicopter SAR technician, n*—a member of the flight crew that conducts tasks as planned and assigned by the helicopter SAR crew chief.

3.2.12 *HELP position, n*—heat escape lessening posture (HELP) is a single subject water rescue technique for heat conservation when immersed in cold water. This technique conserves heat by using personal flotation devices, clothing, and body posture to limit exposure of the body’s major heat loss areas to the cold water.

3.2.13 *marshal, helicopter, n*—a person on the ground responsible for communicating with and guiding the helicopter to a landing zone or HeliSpot.

3.2.14 *personal flotation device (PFD), n*—a buoyant device suitable for use by one subject in water emergencies. These devices may be vests, ring buoys, life preservers, cushions, and other special purpose buoyant devices.

3.2.15 *rescue strop, n*—an item of equipment that is fitted around the patient, under the arms and across the back and secured in front of the chest to secure the patient to a rescue line or helicopter hoist cable.

3.2.16 *trail line/tag line, n*—cord or line manipulated from the ground used to control and guide rescue equipment to the helicopter during hoisting operations.

4. Significance and Use

4.1 This guide establishes the minimum standard for training a Helicopter SAR Technician, who is a crewmember with

focus on the general, field, and search and rescue specific knowledge, skills, and abilities needed to function within a helicopter in support of an inland search and rescue operation. A person trained to this guide shall be recognized as a Helicopter SAR Technician crewmember.

4.2 Every person who is identified as a Helicopter SAR Technician shall meet the requirements of this guide.

4.3 This guide is to be used by individuals and authorities having jurisdiction (AHJs) that wish to identify the minimum training standards for Helicopter SAR Technician.

4.4 This guide is the first level of training for Helicopter SAR Technician and as such, only establishes the minimum knowledge and skills required to perform during helicopter operations.

4.5 This guide by itself is not a training document. It is an outline of the topics required for training or evaluating a Helicopter SAR Technician, and it can be used to develop a training document or program.

4.6 This guide does not stand alone and must be used with the referenced documents to provide the specific information needed by a Helicopter SAR Technician.

4.7 Though this guide establishes the minimum standards, it does not imply that a Helicopter SAR Technician is “in training,” “on probation,” or in any other similar AHJ member status. It is up to the AHJ to determine the requirements and qualifications for member ratings.

4.8 The knowledge, skills, and abilities requirements presented in the following sections are not presented in any particular order and do not represent any specific training sequence.

4.9 A Helicopter SAR Technician shall meet the ASTM standards for the environments for which the technician will be working and shall be able to interface with ground SAR resources.

4.9.1 In order to operate safely around or in a given sub-environment within this area of specialization (Helicopter SAR Technician), the AHJ shall consider the applicability of requiring additional knowledge, skills, and abilities specific to a problem, hazard, technical challenge or environment.

5. General Knowledge, Skills, and Abilities

5.1 The Helicopter SAR Technician shall be able to explain:

5.1.1 The organization’s operational structure.

5.1.2 The overview and philosophy of a helicopter SAR mission.

5.1.3 The general tactics related to aerial search and rescue operations.

5.1.4 The environmental knowledge commensurate with the operating area.

5.1.5 The regulations, policies, procedures, and guidelines with regard to helicopter technician training.

5.2 The Helicopter SAR Technician shall have the ability to be deployed and retrieved by helicopter based on type of aircraft used, equipment and agency policies, procedures, and guidelines. These tactics may include external load operations.

⁴ Federal Aviation Administration, <https://www.faa.gov>; Section II.8.5 Crew Resource Management.

⁵ Federal Aviation Administration, DOT, 14CFR1.1 — Definitions and Abbreviations.

5.2.1 Demonstrates proper use of hand signals (see **X1.7** for example).

5.2.2 Demonstrates appropriate movements in aircraft cabin while in flight.

5.3 A Helicopter SAR Technician shall explain the purpose of and demonstrate the function of the following rescue equipment:

5.3.1 Helicopter SAR Technician harness (personnel carrying device system (PCDS)).

5.3.2 Subject rescue adjuncts (subject harnesses, strops, litters, baskets).

5.3.3 Tether straps (travel restraint).

5.3.4 Carabiners, snap hooks, and other applicable hardware.

5.3.5 Operation of doors, seat belts, and hatches.

5.3.6 Inspection of all applicable search and rescue helicopter equipment.

5.3.7 Explain the use of vision enhancing equipment including but not limited to Electro Optical, Forward Looking Infra-Red (FLIR), and Aviator's Night Vision Imaging System (ANVIS).

5.4 The Helicopter SAR Technician shall explain the need for and demonstrate the use of Personal Protective Equipment (PPE) for flight operations to include at a minimum:

5.4.1 Fire resistant clothing (flight suit).

5.4.2 Fire resistant gloves.

5.4.3 Fire resistant boots.

5.4.4 Active/passive hearing protection.

5.4.5 Approved helicopter flight helmet.

5.4.6 Personal equipment (survival). See **X1.8** for a list of suggested survival equipment for individuals.

5.4.7 Clothing appropriate for anticipated weather conditions.

5.5 A Helicopter SAR Technician shall demonstrate the ability to coordinate a mission with the flight crew based on the specific incident and the related needs, including:

5.5.1 Participate in developing a plan for accomplishing the mission in the most efficient and safe manner.

5.5.2 Assist flight crew with aircraft configuration.

5.5.3 Identify and mitigate flight and mission hazards.

5.5.4 Explain fuel consumption with regards to aircraft endurance and limits for safe landing.

5.6 A Helicopter SAR Technician shall assist crew chief/pilot in preparing cargo load and have knowledge of:

5.6.1 Emergency procedures.

5.6.2 Special mission requirements.

5.6.3 Hazardous materials.

5.7 A Helicopter SAR Technician shall participate in and explain the purpose of the initial operational briefing and demonstrate the ability to provide a safety briefing for passengers.

5.8 A Helicopter SAR Technician shall understand the general concepts related to risk assessment and management of a helicopter operation, including:

5.8.1 The general concepts of CRM.

5.8.2 The general concepts of flight physiology.

5.8.3 The general concepts of aerospace physiology at the awareness level, including physiological effects on the human body, and the normal area of operation.

5.8.4 The general concepts related to high altitude operations and physiology.

5.8.5 The concepts related to fatigue management.

5.8.6 The general concepts related to night adaptation.

5.8.7 The general concepts related to spatial disorientation.

5.8.8 The general concepts related to aircraft performance during extreme hot/cold temperatures.

5.8.9 The general concepts of how weather impacts a helicopter operation such as storms, fog, rain, clouds, and wind.

5.8.10 The general knowledge, skills, and abilities necessary to survive in the operational environment before, during or after an event that requires an individual to perform survival skills to preserve personal life and limb.

5.9 A Helicopter SAR Technician shall be able to demonstrate the following subject management procedures and skills:

5.9.1 Direct a ground rescue crew to the subject's location.

5.9.2 Prioritize subjects in the event of a multi-casualty event.

5.9.3 Proper subject extraction.

5.9.4 Single/multiple subject recovery into cabin area during operations.

5.9.5 Proper securing of subject inside aircraft during transport.

5.9.6 Facilitate subject management during external load operations as well as during other types of retrieval.

5.9.7 Proper subject management in extraction procedures including subject's located on cliffs, on slopes or in trees.

5.9.8 Use of a trail line/tag line.

5.10 A Helicopter SAR Technician shall be able to explain and demonstrate the general concepts related to communications, including:

5.10.1 Radio procedures, protocols, and systems.

5.10.2 Operate the radio equipment.

5.10.3 Relay position coordinates by radio using the appropriate datum/format.

5.10.4 Receive position coordinates by radio.

5.10.5 Plot coordinates and assist pilot in navigating and locating destination.

5.10.6 Ensure assigned aircraft and personal radios are functional prior to commencing daily operations.

5.10.7 Check/change batteries.

5.10.8 Perform radio check with personnel or aircraft on deck.

5.11 A Helicopter SAR Technician shall be able to construct and prepare landing areas, Landing Zone (LZ) or HeliSpot (HS):

5.11.1 Determine predominant wind direction and provide indicator (for example, wind sock, flagging tape).

5.11.2 Demonstrate how to set up clear approach and departure paths.

5.11.3 Identify and advise pilot of any hazard on the ground or in the air (for example, wires, towers, fences).

5.11.4 Determine if the terrain is sloping and whether or not the angle is within acceptable limits. Advise accordingly.

5.11.5 Explain the inherent risks associated with a LZ situated in snow.

5.12 A Helicopter SAR Technician shall be able to act as a helicopter marshal in a LZ or HS and demonstrate and/or explain the following:

5.12.1 Use appropriate hand signals.

5.12.2 Wear appropriate PPE (goggles, hearing protection, and high visibility vest).

5.12.3 Ensure and maintain visual reference with pilot.

5.12.4 Check for obstacles and obstructions before signaling pilot to take off or land.

5.12.5 Ability to vector (guide) aircraft to SAR location at night or in low visibility conditions.

5.12.6 Assist with crash rescue procedures.

5.13 A Helicopter SAR Technician shall have the following inland over water operations knowledge, skills, and abilities:

5.13.1 If tasked with conducting over water rescue operations the Helicopter SAR Technician shall have water rescue training (refer to Guide **F1739**) in addition to other specialized water training.

5.13.2 Be trained in Helicopter Underwater Egress (HUET).

5.13.3 Demonstrate the use of a PFD.

5.13.4 Have training in the use of Helicopter Emergency Egress Device (HEED) breathing systems.

5.13.5 Show the location and demonstrate the use of crew survival equipment.

5.14 A Helicopter SAR Technician shall be able to demonstrate general SAR training topics (refer to Guides **F1633** and **F2209**), including:

5.14.1 Properly inspect/use all applicable rescue and field equipment.

5.14.2 Assist in search for subject on land during day and night operations.

6. Keywords

6.1 helicopter; inland; personnel; rescue; SAR; search; technician; training

APPENDIX

(Nonmandatory Information)

X1. OPERATIONAL SUGGESTIONS AND CONSIDERATIONS—PERSONAL PROTECTIVE EQUIPMENT

X1.1 Personal Gear Suggestions

X1.1.1 Fire Resistant/Nomex Clothing (long-sleeved shirt and pants, or flight suit) should provide the wearer with maximum protection from flash burns. The ensemble should fit loosely to provide trapped airspace that acts as insulation to provide protection. The proper size ensemble covers the maximum area of skin. This includes sleeves long enough to reach the first knuckle on the thumb before securing snugly over the flight gloves at the wrist. The pant legs should be long enough to completely cover the boot tops while in a seated position. The slide fastener front closure should provide coverage high on the neck.

X1.1.2 Fire resistant and/or Leather Gloves.

X1.1.3 Fire-resistant Boots.

X1.1.4 Hearing Protection (refer to **X1.3**).

X1.1.5 Approved Helicopter Flight Helmet (refer to **X1.2**).

X1.1.6 Survival Equipment as applicable (PFD, Life Rafts).

X1.2 Helicopter Flight Helmets

X1.2.1 The approved helicopter flight helmet, consists of a one-piece hard shell made of polycarbonate, Kevlar, carbon fiber or fiberglass, should cover the top, sides (including the temple area and to below the ears) and the rear of the head. The helmet should be equipped with a chin strap and should be appropriately adjusted for proper fit; helmets should be individually fitted for maximum protection.

X1.3 Hearing Protection

X1.3.1 Hearing protection is required when inside or around operating helicopters. The helicopter flight helmet provides the requisite protection, the addition of earplugs for frequent users of helicopters is recommended.

X1.4 Eye Protection

X1.4.1 Goggles, or other approved safety eyewear, should be worn while performing ground duties around operating helicopters. A helicopter flight helmet with visor down may be utilized in lieu of goggles.

X1.5 Material

X1.5.1 The approved material for flight suits, gloves, and recommended for outer garments, garments worn under the flight suit, and undergarments is generically known as “fire resistant clothing.” The actual material may be fire resistant clothing, polyamide, aramide, polybenzimidazole, Kevlar, or blends thereof.⁶**Fig. X1.1**

X1.6 Body Substance Protection

X1.6.1 Carry latex gloves for protection from patient body fluids and blood-borne pathogens. Proper body substance precautions should be utilized in transport of the deceased.

⁶ *Interagency Helicopter Operations Guide (IHOG)*, NFES 1885, June 2009.

HELICOPTER HAND SIGNALS

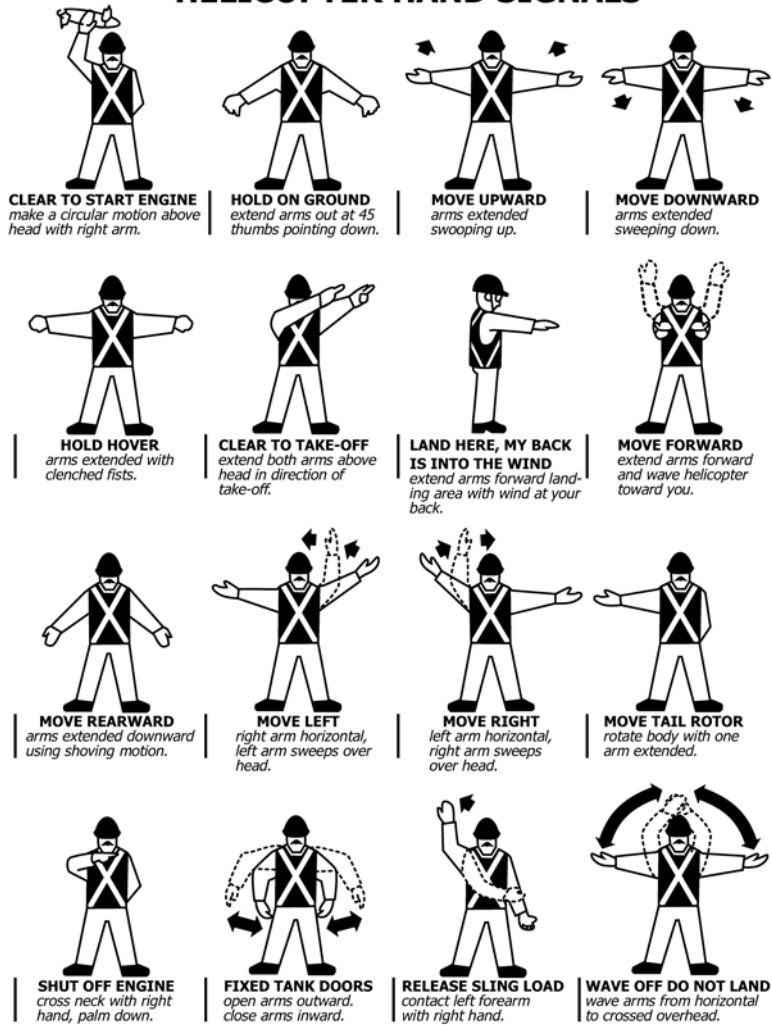


FIG. X1.1 Helicopter Hand Signals

X1.7 Examples of Helicopter Hand Signals

X1.7.1 See Fig. X1.1 for examples of common hand signals used to communicate with the helicopter.⁶ Refer to agency specific hand signals used for the various operations.

X1.8 Survival and Safety Suggestions

X1.8.1 *Overland Survival*—Like overwater missions, planning for overland missions requires careful consideration of all elements of risk management and hazard reduction. On overland flights, personnel will be more likely to possess appropriate garments for the mission area involved. This does not exempt mission planners from assuring that crews and passengers have adequate clothing to survive in the event of a mishap. See Table X1.1.

X1.8.2 *Personal Survival Vests or Hand-Carried Survival Kits*—In addition to the required survival kits, personal survival vests or hand-carried survival kits are strongly recommended but not required. **CAUTION**—Accident experience has shown conclusively that survival equipment not attached to the occupants at the time of egress will not be available to the survivors.⁶

X1.8.3 Missions where safety and/or effectiveness may be enhanced by a flight crewmember being on board during the conduct of external load missions include, but are not limited to:

X1.8.3.1 Conditions of visibility (smoke, smog) and/or terrain where the pilot requests an observer aboard to optimize detection of obstacles and other aircraft.

X1.8.3.2 Complexity of the incident or project and the cockpit workload, to include large numbers of aircraft operating in the vicinity, close and frequent coordination needed with ground personnel, overloaded radio frequencies.

X1.8.3.3 Areas of airspace complexity (military training areas such as Special-Use Airspace or Military Training Routes; high-density civil operations) where the observer can enhance the ability to avoid collisions with other aircraft.

X1.8.4 The pilot has the final authority regarding carrying any flight crewmember during external load operations. Flight crew should conduct an on-site risk analysis which addresses the benefits of increased safety and efficiency versus the added exposure. The mission(s) should also be adequately planned.

TABLE X1.1 Survival Equipment

| # | WINTER | # | SUMMER |
|---|--|---|--|
| 1 | Compass | 1 | Compass |
| 1 | Knife | 1 | Knife |
| 1 | Flashlight with 2 extra batteries | 1 | Flashlight with 2 extra batteries |
| 1 | Signal Mirror | 1 | Signal Mirror |
| 1 | Additional Signalling Device (Strobe, Smoke Bomb, Water Dye, etc.) | 1 | Additional Signalling Device (Strobe, Smoke Bomb, Water Dye, etc.) |
| 1 | Box Matches in Waterproof Container | 1 | Box Matches in Waterproof Container |
| 1 | Individual First Aid Kit | 1 | Individual First Aid Kit |
| 1 | 40 ft Length Nylon Rope | 1 | 40 ft Length Nylon Rope |
| 1 | Roll Toilet Paper | 1 | Roll Toilet Paper |
| 2 | Candles | 2 | Candles |
| 1 | 50 Gal. Capacity Trash Bag | 1 | 50 Gal. Capacity Trash Bag |
| 4 | Quarts Water/Person | 4 | Quarts Water/Person |
| 1 | Water Bag | 1 | Water Bag (collapsible) |
| 1 | Whistle | 1 | Whistle |
| 1 | Handsaw or Wiresaw | 1 | Handsaw or Wiresaw |
| 1 | Collapsible Shovel | 1 | Collapsible Shovel |
| 6 | Meals-Ready-To-Eat (MREs)/Person | 4 | Meals-Ready-To-Eat (MREs)/Person |
| 1 | Survival Manual, Winter | 1 | Survival Manual, Desert |
| 1 | 46 pt. IV Tubing | 1 | 46 pt. IV Tubing |
| 1 | Bottle Iodine Tablets | 1 | Bottle Iodine Tablets |
| 1 | Arctic Sleeping Bag/2 persons | 1 | Snakebite Kit |
| 1 | Metal Container (for melting snow) | 1 | Bottle Insect Repellent |
| 1 | Container w/carrying handles or straps | 1 | Container w/carrying handles or straps |
| 1 | Personal ELT (per occupant) | 1 | Insect Head Net (per occupant) |
| 1 | Signal Panels | 1 | Personal ELT (per occupant) |
| 2 | Snow Shoes (set) | 2 | Signal Panels |
| 1 | Ax or Hatchet | 1 | Ax or Hatchet |
| 1 | Gill net/assorted Fishing Tackle | 1 | Bottle of Sunscreen |
| | | 1 | Gill net/assorted Fishing Tackle |

X1.9 Passenger Safety Briefings

X1.9.1 Briefings should be given to every passenger prior to entering the safety circle to board the helicopter or in case of urgent SAR as soon as practical upon entering aircraft. The safety briefing may be given by the pilot or as delegated by the pilot to authorized and qualified personnel.

X1.9.2 Ensure that instructions are clear and understood.

X1.9.3 Ensure in-flight emergency procedures briefing is included.

X1.9.4 It is recommended that passengers be briefed in groups rather than individually.

X1.10 In-Flight Emergency Procedures

X1.10.1 Be aware of the location and normal operation of emergency exits.

X1.10.2 Follow instructions of pilot/crew chief personnel.

X1.10.3 Snug seat belt and shoulder harness; secure gear.

X1.10.4 Crash position WITH SHOULDER HARNESS (four point OR single diagonal strap): sit in full upright position with head and back pressed against seat and use arms to brace in position. If time permits and so equipped, lock the inertial reel.

X1.10.5 Crash position WITH LAP BELT ONLY: bend over as far as possible and hold onto your legs.

X1.10.6 Assist any injured subject who cannot leave the aircraft.

X1.10.7 Move clear of the aircraft only after rotor blades stop or when instructed to do so by the pilot or flight crew.

X1.10.8 Assess situation, follow pilot/crew chief instructions, render first aid, and remove first aid kit, survival kit, radio, ELT and fire extinguisher.

X1.10.9 Underwater egress if route of flight is over water.

X1.11 Aircraft Operations Considerations

X1.11.1 Regardless of the size or complexity of an operation, there are sequential and logical steps which should be taken to achieve a safe, efficient operation and accomplish incident or project objectives.

X1.11.2 Items such as landing site selection, set-up and layout, operational phases, and demobilization should be considered from the onset of any landing zone (LZ) operation in order to be completely successful. The need to be flexible, as well as to anticipate and plan for most reasonable occurrences and contingencies, cannot be overemphasized.

X1.11.3 Due to the high-risk nature of search and rescue missions, it is critical that search and rescue personnel possess a complete knowledge of all aspects of helicopter operations. The flight crew of each helicopter search and rescue mission should implement risk assessment and management techniques.

X1.11.4 It is very easy to become caught up in the urgency of a search and rescue mission, especially those involving life-threatening situations. Regardless of the degree of emergency, never forget to utilize basic helicopter procedures. Maintain your flight discipline at all times.

X1.11.5 All aviation search and rescue operations should be conducted by qualified crewmembers.

X1.11.6 When planning aviation missions, crewmembers need to ensure compliance with guidelines and procedures and to assist in safe, effective operations. During complex operations, it is advisable to utilize the Incident Command System aviation structure.

X1.11.7 “Don’t become part of the emergency!” Choose an aircraft capable of meeting performance requirements for the mission.

X1.11.8 In emergency situations landing areas may not always be optimal. Nevertheless, particular care should be exercised in selecting landing sites for search and rescue operations. Where possible, identify natural openings which could be utilized as a temporary landing zone (LZ) with little or no improvement. Avoid use of schoolyards, parking lots, local parks, unless absolutely necessary and then only if strict security by local authorities can be provided.

X1.12 Loading Procedures after Safety Briefing

X1.12.1 After the safety briefing has been given, consider the following:

X1.12.1.1 Crewmembers or other authorized, trained personnel should assist in loading operations.

X1.12.1.2 Personal items carried on board should be adequately secured.

X1.12.1.3 Prior to approaching the helicopter, remove proper items that may impede proper fastening of seatbelts/shoulder harnesses; these items should be placed and secured in an appropriate area.

X1.12.1.4 Stay in safe area prescribed by flight crew or other authorized personnel until given the direction to load.

X1.12.1.5 Wear appropriate head protection.

X1.12.1.6 First subject into the helicopter passenger compartment should move to center seat, or seat assigned by pilot or flight crew personnel.

X1.12.1.7 Find seat belt and fasten; if unable, advise the flight crew who will assist.

X1.12.1.8 Ensure that personal protective equipment is properly worn.

X1.12.1.9 No smoking around the helicopter.

X1.12.1.10 Ensure that all personnel understand the instructions given by pilot or their designee. **CAUTION**—When opening hinged doors (not on sliding tracks) to embark/disembark passengers, keep one hand on the door at all times until the door is securely re-latched.⁶

X1.12.1.11 Secure patients to the litter, then secure the litter to the helicopter. When conducting overwater SAR operations the litter should meet floatation requirements.

X1.12.1.12 If possible passengers should not be loaded or unloaded upslope toward rotor system.

X1.13 In-Flight Precautions

X1.13.1 No smoking during flight or within 50 feet of the aircraft.

X1.13.2 Keep clear of flight controls: **DO NOT TOUCH** controls, except in an emergency where, if the pilot is incapacitated, a passenger may shut down the fuel and electrical supply.

X1.13.3 Secure all items, especially when flying with the door(s) off.

X1.13.4 Be aware of emergency exits and read instructions pertaining to emergency egress; if in doubt, ask questions.

X1.13.5 Be aware of the location and normal operation of helicopter doors.

X1.13.6 Follow the instructions of the pilot.

X1.13.7 Loose items inside of aircraft should be secured and manageable.

X1.13.8 All baggage secured in aircraft or cargo compartment.

X1.13.9 Never throw trash or objects from the helicopter that may damage the rotors or aircraft.

X1.13.10 No movement inside aircraft once seated.

X1.13.11 Unbuckle only when directed to do so by pilot/crew chief; leave doors closed and wait for crew chief personnel to unload.

X1.13.12 Know location of first aid kit, survival kit, fire extinguisher, ELT (Emergency Locator Transmitter), fuel and battery shutoff switch location and operation, radio operation, and the use of oxygen (if available).

X1.14 Unloading Procedures

X1.14.1 Wait for pilot, flight crewmember, or other authorized personnel to give clear signal for offloading.

X1.14.2 Doors should be opened only by crewmembers, other authorized personnel, or at direction of pilot when no one is available at the landing site.

X1.14.3 Remove seat belts and lay them on the seat; if possible, refasten and lay on seat. **CAUTION**—Ensure that seat belts are inside the aircraft when closing doors. A loose seat belt can cause several thousand dollars of damage when the helicopter becomes airborne.

X1.14.4 Maintain tight control of all personal items. If an item is lost, do not go after it.

X1.14.5 Exit the helicopter slowly and use the departure route indicated by flight crew personnel or the pilot; when large numbers of passengers are being transported, flight crew personnel will normally accompany passengers from aircraft to the safety zone. **CAUTION**—When exiting the aircraft, do not walk toward the tail rotor or uphill. If in doubt, ask the pilot or crew chief on the approved exit route.

X1.14.6 After leaving the helicopter, move to an area which is not underneath the helicopter’s departure flight path.

X1.14.7 Off-loading during shutdown of helicopter should be avoided.

X1.15 Approach and Departure Paths

X1.15.1 Always approach and depart from the down slope (lower) side as directed by pilot/crew chief.

X1.15.2 Approach and depart helicopter in a crouch position, do not run.

X1.15.3 Keep in pilot’s field of vision at all times.

X1.15.4 Stay clear of landing area when helicopters are landing or departing.

X1.15.5 Stay away from the main and tail rotors. Do not chase any item that has become unsecured.

X1.15.6 Never go near the tail of a helicopter.

X1.16 Tools and Equipment

X1.16.1 Secure hand tools and equipment awaiting transport.

X1.16.2 Make assignments for carrying tools/equipment to/from helicopter.

X1.16.3 Carry tools/long objects parallel to the ground, never on shoulder.

X1.16.4 All tools and equipment loaded/unloaded by qualified personnel.

X1.16.5 Portable radios should be turned off.

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