



Standard Guide for Swiftwater/Flood Rescue Technician Basic¹

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1. Scope

1.1 This guide establishes the areas of expertise that Search and Rescue (SAR) Swiftwater/Flood Rescue Technician Basic (SWFT-Basic) personnel shall demonstrate in order to perform in, on, or around a Swiftwater environment.

1.1.1 Specifically, this guide defines the recommended training required to prepare SWFT-Basic personnel, or equivalent, for responding to or conducting shore-based Swiftwater and flood rescue operations.

1.1.2 This guide establishes the general areas of expertise that SWFT-Basic personnel shall demonstrate. This guide does not cover specialized types of Swiftwater/flood SAR, such as helicopter and boat-based rescues.

1.1.3 This guide also establishes the minimum training requirements.

1.2 This is the entry-level position for Swiftwater/flood responders.

1.3 SWFT-Basic personnel shall be able to recognize, reduce, eliminate, or mitigate, within the scope of their training, the hazards and risks in a Swiftwater or flood situation or environment and be able to request appropriate additional resources.

1.4 This guide identifies types of rescues, tactics, and systems that are typically used by SWFT-Basic personnel, such as shore-based rescues using talking, reaching, throwing, and wading methods.

1.5 SWFT-Basic personnel who have met the minimum qualifications and experience within this guide are capable of performing shore-based rescues and assisting with in-water rescues from the shore under qualified supervision.

2. Referenced Documents

2.1 ASTM Standards:²

¹ This test method is under the jurisdiction of ASTM Committee F32 on Search and Rescue and is the direct responsibility of Subcommittee F32.03 on Personnel, Training and Education.

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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.

F1422 [Guide for Using the Incident Command System Framework in Managing Search and Rescue Operations](#)
F1768 [Guide for Using Whistle Signals During Rope Rescue Operations](#)
F2752 [Guide for Training for Level I Rope Rescue \(R1\) Rescuer Endorsement](#)

2.2 Other Documents:

[DRAFT Land Search and Rescue Addendum to the National Search and Rescue Supplement to the International Aeronautical and Maritime Search and Rescue Manual, Version 1.0, November 2011](#)³

[National Response Framework \(NRF\), FEMA, January 2013](#)⁴

[Title 29 of the Code of Federal Regulations \(29 CFR\), Subtitle B, Chapter XVII, 1910.120\(Q\)\(6\)\(i\) "First responder awareness training"](#)

3. Terminology

3.1 Acronyms:

- 3.1.1 *AHJ*—Authority Having Jurisdiction
- 3.1.2 *CPR*—Cardiopulmonary Resuscitation
- 3.1.3 *FEMA*—Federal Emergency Management Agency
- 3.1.4 *HazMat*—Hazardous Materials
- 3.1.5 *HELP*—Heat Escape Lessening Posture/Position
- 3.1.6 *ICS*—Incident Command System
- 3.1.7 *LKP*—Last Known Point
- 3.1.8 *NIMS*—National Incident Management System
- 3.1.9 *NRF*—National Response Framework
- 3.1.10 *PLS*—Point Last Seen
- 3.1.11 *PPE*—Personal Protective Equipment
- 3.1.12 *PTB*—Position Task Book
- 3.1.13 *RBB*—Rigid Buoyant Boats
- 3.1.14 *RHIB*—Rigid Hull Inflatable Boat
- 3.1.15 *SAR*—Search and Rescue
- 3.1.16 *SWFT-Basic*—Swiftwater/Flood Technician-Basic

³ [http://www.fs.fed.us/fire/aviation/av_library/Revision%205-EHE%20Source%20List%20\(01-12\).pdf](http://www.fs.fed.us/fire/aviation/av_library/Revision%205-EHE%20Source%20List%20(01-12).pdf).

⁴ <http://www.fema.gov/national-response-framework>

3.1.17 *SWFT-Intermediate*—Swiftwater/Flood Technician-Intermediate

3.1.18 *SWFT-Advanced*—Swiftwater/Flood Technician-Advanced

3.1.19 *USCG*—U.S. Coast Guard

3.2 *Definitions Specific to the Series of Swiftwater/Flood Search and Rescue Guides:*

3.2.1 *authority having jurisdiction*—an organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, installation, or a procedure.

3.2.2 *downstream*—the direction of flow leading to a lower position in a watercourse.

3.2.3 *flood*—a great flowing or overflowing of water, especially over land not usually submerged.⁵

3.2.4 *personal flotation device (PFD)*—a U.S. Coast Guard (USCG) approved buoyant device suitable for use by one person to stay afloat in a water emergency. This may be a vest, ring buoy, life preserver, cushion, or other special purpose buoyant apparatus. Types include the following:

3.2.4.1 *Type I*—Offshore life jacket.

3.2.4.2 *Type II*—Near-shore buoyant vest.

3.2.4.3 *Type III*—Flotation aid.

3.2.4.4 *Type IV*—Throwable device.

3.2.4.5 *Type V*—Special use device.

3.2.5 *recovery*—an operation to retrieve deceased persons from the current position and move them to a designated place.

3.2.6 *rescue*—an operation to retrieve persons in distress, provide for the initial medical or other needs, and deliver them to a place of safety.⁶

3.2.7 *search*—an operation using available trained personnel and facilities to locate persons in distress.⁷

3.2.8 *shore-based*—swiftwater/flood search and rescue operations conducted from land adjacent to the water.

3.2.9 *Swiftwater*—water moving with sufficient force to present a significant life and safety hazard to a person entering it.

3.2.10 *Swiftwater/flood search and rescue operations*—actions intended to locate and save individuals caught in, or stranded by, swift or flood waters, conducted using the National Incident Management System (NIMS)/ICS, or equivalent.

3.2.11 *Swiftwater/flood search and rescue technician*—an individual trained to perform Swiftwater/flood search and rescue operations.

3.2.12 *throw bag*—a length of floating rope that is stored in a throwable container. When using a throw bag for water rescue, the life safety line should be the appropriate tensile strength as determined by the AHJ.

3.2.13 *type*—a classification series developed to identify an incident's level of complexity ranging from most complex (Type 1) to least complex (Type 5).

4. Significance and Use

4.1 This guide establishes the minimum requirements for training SWFT-Basic personnel. A person trained to this guide is considered to be a SWFT-Basic.

4.2 Every person who is identified as a SWFT-Basic shall have met the requirements, or equivalent, of this guide.

4.3 This guide is to be used by the individuals and Authorities Having Jurisdiction (AHJs) that wish to identify the minimum training required for SWFT-Basic. No advanced skills are included or implied.

4.4 This guide was developed specifically for use in the United States, but may be used in other countries as needed.

4.5 This guide should be used in conjunction with established and authorized guidelines and procedures mandated by the AHJ.

4.6 Nothing in this guide precludes an AHJ from adding additional requirements for its own members.

4.7 The AHJ shall determine that personnel, agencies, and organizations are qualified and authorized to participate in Swiftwater/flood search and rescue operations.

4.8 The AHJ shall determine the evaluation process used to assess the extent to which the requirements of this guide are met.

4.9 4.9 Swiftwater personnel should only perform activities in the Swiftwater environment after a thorough risk assessment and appropriate risk mitigation efforts (such as the use of personal protective equipment (PPE), restricting efforts to shore-based techniques, or delaying a recovery until more favorable water conditions exist) have been performed. At the very least, personnel should follow the appropriate national, federal, state, tribal, provincial, and local safety standards as they apply to activities in Swiftwater environments. SWFT-Basic personnel should be supervised by a Swiftwater/Flood Rescue Technician-Intermediate (SWFT-Intermediate) or Swiftwater/Flood Rescue Technician-Advanced (SWFT-Advanced) for in-water rescue operations. Shore-based rescue does not necessarily require SWFT-Intermediate or SWFT-Advanced supervision, but any rescue requires appropriate command and control, determined by the level of complexity. Rescue shall be done using the appropriate safety precautions.

5. General Knowledge, Qualifications, and Training

5.1 SWFT-Basic personnel shall have the following knowledge, qualifications, and training:

5.1.1 Federal Emergency Management Agency (FEMA) and NIMS training or equivalent, to include the following:

5.1.1.1 ICS/IS 100: Introduction to ICS;

⁵ <http://dictionary.reference.com/browse/flood?s=t> (Accessed February 7, 2013.)

⁶ DRAFT Land Search and Rescue Addendum to the National Search and Rescue Supplement to the International Aeronautical and Maritime Search and Rescue Manual, Version 1.0, November 2011, [http://www.fs.fed.us/fire/aviation/av_library/Revision%205-EHE%20Source%20List%20\(01-12\).pdf](http://www.fs.fed.us/fire/aviation/av_library/Revision%205-EHE%20Source%20List%20(01-12).pdf).

⁷ Land Search and Rescue Addendum to the National Search and Rescue Supplement to the International Aeronautical and Maritime Search and Rescue Manual, Version 1.0, November 2011, http://www.uscg.mil/hq/cg5/cg534/nsarc/Land_SAR_Addendum/Published_Land%20SAR%20Addendum%20%281118111%29%20-%20Bookmark.pdf

5.1.1.2 ICS/IS-200: ICS for Single Resources and Initial Action Incidents;

5.1.1.3 As required by the AHJ, or when responding to an outside jurisdiction:

(1) FEMA IS-700: NIMS, An Introduction; and

(2) FEMA IS-800: National Response Framework (NRF), An Introduction.

5.1.2 SWFT-Basic personnel shall additionally have the following training:

5.1.2.1 Basic Aircraft Safety (A-101), or equivalent;

5.1.2.2 Hazardous materials (HazMat) awareness level training that includes the information defined in 29 CFR 1910.120(Q)(6)(i), or equivalent, as determined by the AHJ;

5.1.2.3 Swiftwater/flood rescue pre-planning and notification systems;

5.1.2.4 Identifying the need for additional assistance and/or expertise, and how to request it;

5.1.2.5 Bloodborne/Airborne Pathogens training;

5.1.2.6 Physical fitness standards as established and required by the AHJ; and

5.1.2.7 Emergency medical skills as established and required by the AHJ.

5.1.3 SWFT-Basic personnel shall undergo annual refresher and/or maintenance training, as determined by the AHJ, including the following:

5.1.3.1 PPE;

5.1.3.2 Self-rescue techniques;

5.1.3.3 Simple rescue techniques; and

5.1.3.4 Hydrology.

5.2 *Agency Policy Updates*—This guide recommends that personnel meet the following minimum qualifications and experience to function within a Swiftwater/flood search and rescue operation. Depending on the geography of the AHJ, the AHJ may require SWFT-Basic personnel to have rope skills in accordance with Guide **F2752**.

5.2.1 Demonstrate an understanding of the Safety Code of American Whitewater (refer to **X1.1**).⁸

5.2.2 Demonstrate an understanding of visual and audible river signals (refer to **X1.2** and **X1.3**).

5.2.3 Demonstrate knowledge and understanding of the policies, standards, objectives, and goals of the AHJ in regard to Swiftwater/flood rescue.

5.2.4 Demonstrate knowledge and understanding of the Swiftwater/flood rescue team member roles and responsibilities.

5.2.5 Demonstrate knowledge and understanding of establishing point last seen (PLS)/last known point (LKP).

5.2.6 Demonstrate knowledge and understanding of procedures for interviewing witnesses.

5.2.7 Demonstrate knowledge and understanding of the Incident Command System (ICS) as it applies to Swiftwater/flood rescue operations.

5.2.8 Demonstrate knowledge and understanding of land navigation, including the following:

5.2.8.1 General use of maps, compasses, and GPSs; and

5.2.8.2 The ability to plot on a map and locate on a GPS receiver a reported PLS and LKP. Demonstrate knowledge and understanding of hazard recognition, which may include: ineffective team communication, changing conditions, lack of command and control, multi-agency efforts without coordination, night operations, improvised techniques, high water flows, strainers, flood debris, cold water, hydraulics, low-head dams, multiple patients, multiple incidents, air temperature extremes, man-made obstacles, and debris.

5.2.9 SWFT-Basic personnel shall demonstrate knowledge and understanding of safety requirements specific to Swiftwater/flood rescue and the Swiftwater /flood environment, including the following:

5.2.9.1 Safe work area zones;

5.2.9.2 Risks to personnel from pollution, recommended personal hygiene techniques to reduce these risks, and procedures to be used on contaminated personnel;

5.2.9.3 The use and effectiveness of the Heat Escape Lessening Posture/Position (HELP);

5.2.9.4 The use and effectiveness of the huddle position; and

5.2.9.5 The use and effectiveness of the self-rescue/swimmer position.

5.2.10 SWFT-Basic personnel shall demonstrate knowledge and understanding of hydrology in regard to its effects on Swiftwater/flood rescue, including the following:

5.2.10.1 Water temperature;

5.2.10.2 Currents, including flow rates, force, and features (e.g., eddies, holes, etc.);

5.2.10.3 Contaminants;

5.2.10.4 Hazards, including: strainers; sieves; weirs/low head dams; under cuts; debris/loads; high water flows; strainers; flood debris; cold water; hydraulics; and low-head dams.

5.2.10.5 Shoreline characteristics and conditions, including ice, mud, and steep or unstable banks;

5.2.10.6 Weather, both local and upstream; and

5.2.10.7 Tides.

5.2.11 SWFT-Basic personnel shall demonstrate knowledge and understanding of the physiology of drowning, including the following:

5.2.11.1 Basic survivor care;

5.2.11.2 The occurrence of immersion shock and the cold water reflex and their effects; and

5.2.11.3 The signs and symptoms of hypothermia and hyperthermia and their effects on patient care.

5.2.11.4 SWFT-Basic personnel shall demonstrate knowledge and understanding of water rescue equipment and its limitations, including the following:

5.2.11.5 Throw bags and other throwing rescue equipment used by the AHJ;

5.2.11.6 Reaching devices; and

5.2.11.7 Other items such as boards, ladders, and floats.

5.2.12 SWFT-Basic personnel shall demonstrate cognitive and practical understanding of night rescue considerations and operations; and

5.2.13 Self-awareness, including limitations.

5.2.14 SWFT-Basic personnel shall demonstrate knowledge and understanding of water rescue PPE and its limitations, including the following:

⁸ American Whitewater, Safety Code of American Whitewater – 2012, <http://www.americanwhitewater.org/content/Wiki/safety:start?>

5.2.15 Minimum customization equipment, such as a whistle, and a cutting device;

5.2.15.1 Wet suits, dry suits, ice suits, their similarities, and their differences;

5.2.15.2 Thermal protection for the rescuer and clothing and equipment intended for that purpose;

5.2.15.3 Helmets specifically designed for water rescue;

5.2.15.4 Waterproof lighting; and

5.2.15.5 Gloves and footwear.

5.2.16 SWFT-Basic personnel shall demonstrate knowledge and understanding of the advantages and risks specific to wading rescues, including the following:

5.2.16.1 Use of the technique only when water depths can be confirmed; and

5.2.16.2 Use of the technique only when appropriate downstream safety procedures have been implemented.

6. Skills and Abilities Specific to a Swiftwater/Flood Rescue

6.1 SWFT-Basic personnel shall demonstrate an understanding of, and the ability to use, visual and audible river signals defined in **X1.2** and **X1.3**.

6.2 SWFT-Basic personnel shall demonstrate cognitive and practical understanding of the following:

6.2.1 Huddle position;

6.2.2 Donning and doffing of relevant PPE;

6.2.3 Self-rescue techniques;

6.2.4 Throwing techniques;

6.2.5 Talking rescue techniques; and

6.2.6 Reaching rescue techniques.

7. Keywords

7.1 flood; rescue; search; Swiftwater; technician; water

APPENDIXES

(Nonmandatory Information)

X1. SAFETY CODE OF AMERICAN WHITEWATER⁹

X1.1 Safety Code of American Whitewater

X1.1.1 *Personal Preparedness and Responsibility*

X1.1.1.1 *Be a competent swimmer*, with the ability to handle yourself underwater.

X1.1.1.2 *Wear a life jacket*, a snugly-fitting vest-type life preserver offers back and shoulder protection as well as the flotation needed to swim safely in whitewater.

X1.1.1.3 *Wear a solid, correctly-fitted helmet* when upsets are likely. This is essential in kayaks or covered canoes, and recommended for open canoeists using thigh straps and rafters running steep drops.

X1.1.1.4 *Do not boat out of control*. Your skills should be sufficient to stop or reach shore before reaching danger. Do not enter unless you are reasonably sure that you can run it safely or swim it without injury.

X1.1.1.5 *Whitewater rivers contain many hazards that are not always easily recognized. The following are the most frequent killers:*

(1) *High Water*—The river’s speed and power increase tremendously as the flow increases, raising the difficulty of most rapids. Rescue becomes progressively harder as the water rises, adding to the danger. Floating debris and strainers make even an easy rapid quite hazardous. It is often misleading to judge the river level at the put in, since a small rise in a wide, shallow place will be multiplied many times where the river narrows. Use reliable gauge information whenever possible, and be aware that sun on snowpack, hard rain, and upstream dam releases may greatly increase the flow.

(2) *Cold*—Cold drains your strength and robs you of the ability to make sound decisions on matters affecting your

survival. Cold-water immersion, because of the initial shock and the rapid heat loss that follows, is especially dangerous. Dress appropriately for bad weather or sudden immersion in the water. When the water temperature is less than 50°F, a wetsuit or drysuit is essential for protection if you swim; the next best is wool or pile clothing under a waterproof shell. In this case, you should also carry waterproof matches and a change of clothing in a waterproof bag. If, after prolonged exposure, a person experiences uncontrollable shaking, loss of coordination, or difficulty speaking, he or she is hypothermic, and needs your assistance.

(3) *Strainers*—Brush, fallen trees, bridge pilings, undercut rocks or anything else that allows river current to sweep through can pin boats and boaters against the obstacle. Water pressure on anything trapped this way can be overwhelming. Rescue is often extremely difficult. Pinning may occur in fast current, with little or no whitewater to warn of the danger.

(4) *Dams, Weirs, Ledges, Reversals, Holes, and Hydraulics*—When water drops over an obstacle, it curls back on itself, forming a strong upstream current that may be capable of holding a boat or swimmer. Some holes make for excellent sport. Others are proven killers. Paddlers who cannot recognize the difference should avoid all but the smallest holes. Hydraulics around man-made dams shall be treated with utmost respect regardless of their height or the level of the river. Despite their seemingly benign appearance, they can create an almost escape-proof trap. The swimmer’s only exit from the “drowning machine” is to dive below the surface when the downstream current is flowing beneath the reversal.

X1.1.1.6 *Broaching*, when a boat is pushed sideways against a rock by strong current, it may collapse and wrap, this is especially dangerous to kayak and decked canoe paddlers; these boats will collapse and the combination of indestructible

⁹ American Whitewater, Safety Code of American Whitewater – 2012, <http://www.americanwhitewater.org/content/Wiki/safety:start?>

hulls and tight outfitting may create a deadly trap. Even without entrapment, releasing pinned boats can be extremely time-consuming and dangerous. To avoid pinning, throw your weight downstream towards the rock; this allows the current to slide harmlessly underneath the hull.

X1.1.1.7 *Boating alone is discouraged.* The minimum party is three people or two craft. *Have a frank knowledge of your boating ability*, and don't attempt rivers or rapids that lie beyond that ability.

X1.1.1.8 *Be in good physical and mental condition, consistent with the difficulties that may be expected.* Make adjustments for loss of skills due to age, health, fitness. Any health limitations shall be explained to your fellow paddlers prior to starting the trip.

X1.1.1.9 *Be practiced in self-rescue*, including escape from an overturned craft. The Eskimo Roll is strongly recommended for decked boaters who run rapids Class IV or greater, or who paddle in cold environmental conditions.

X1.1.1.10 *Be trained in rescue skills, Cardiopulmonary Resuscitation (CPR), and first aid* with special emphasis on recognizing and treating hypothermia. It may save your friend's life.

X1.1.1.11 *Carry equipment needed for unexpected emergencies*, including footwear that protects your feet when walking out, a throw rope, knife, whistle, and waterproof matches. If you wear eyeglasses, tie them on and carry a spare pair on long trips. Bring cloth repair tape on short runs, and a full repair kit on isolated rivers. Do not wear bulky jackets, ponchos, heavy boots, or anything else that could reduce your ability to survive a swim.

X1.1.1.12 Despite the mutually supportive group structure described in this code, *individual paddlers are ultimately responsible for their own safety, and shall assume sole responsibility for the following decisions:*

(1) The decision to participate on any trip. This includes an evaluation of the expected difficulty of the rapids under the conditions existing at the time of the put-in.

(2) The selection of appropriate equipment, including a boat design suited to their skills and the appropriate rescue and survival gear.

(3) The decision to scout any rapid, and to run or portage according to their best judgment. Other members of the group may offer advice, but paddlers should resist pressure from anyone to paddle beyond their skills. It is also their responsibility to decide whether to pass up any walk-out or take-out opportunity.

(4) All trip participants should consistently evaluate their own and their group's safety, voicing their concerns when appropriate and following what they believe to be the best course of action. Paddlers are encouraged to speak with anyone whose actions on the water are dangerous, whether they are a part of your group or not.

X1.1.2 *Boat and Equipment Preparedness*

X1.1.2.1 *Test new and different equipment* under familiar conditions before relying on it for difficult runs. This is especially true when adopting a new boat design or outfitting system. Low-volume craft may present additional hazards to inexperienced or poorly conditioned paddlers.

X1.1.2.2 *Be sure your boat and gear are in good repair* before starting a trip. The more isolated and difficult the run, the more rigorous this inspection should be.

X1.1.2.3 *Install flotation bags* in non-inflatable craft, securely fixed at each end, designed to displace as much water as possible. Inflatable boats should have multiple air chambers and be test-inflated before launching.

X1.1.2.4 *Have strong, properly sized paddles or oars* for controlling your craft. Carry sufficient spares for the length and difficulty of the trip.

X1.1.2.5 *Outfit your boat safely.* The ability to exit your boat quickly is an essential component of safety in rapids. It is your responsibility to see that there is absolutely nothing to cause entrapment when coming free of an upset craft. This includes the following:

(1) Spray covers that won't release reliably or that release prematurely.

(2) Boat outfitting too tight to allow a fast exit, especially in low volume kayaks or decked canoes. This includes low-hung thwarts in canoes lacking adequate clearance for your feet and kayak footbraces that fail or allow your feet to become wedged under them.

(3) Inadequately supported decks that collapse on a paddler's legs when a decked boat is pinned by water pressure. Inadequate clearance with the deck because of your size or build.

(4) Loose ropes that cause entanglement. Beware of any length of loose line attached to a whitewater boat. All items shall be tied tightly and excess line eliminated; painters, throw lines, and safety rope systems shall be completely and effectively stored. Do not knot the end of a rope as it can get caught in cracks between rocks.

X1.1.2.6 *Provide ropes* that permit you to hold on to your craft so that it may be rescued. The following methods are recommended:

(1) Kayaks and covered canoes should have grab loops of 1/4 in. plus rope or equivalent webbing sized to admit a normal-sized hand. Stern painters are permissible if properly secured.

(2) Open canoes should have securely anchored bow and stern painters consisting of 8 to 10 ft of 1/4 in. plus line. These shall be secured in such a way that they are readily accessible, but cannot loosen accidentally. Grab loops are acceptable, but are more difficult to reach after an upset.

(3) Rafts and dories may have taut perimeter lines threaded through the loops provided. Footholds should be designed so that a paddler's feet cannot be forced through them, causing entrapment. Flip lines should be carefully and reliably stowed.

X1.1.2.7 *Know your craft's carrying capacity*, and how added loads affect boat handling in whitewater. Most rafts have a minimum crew size that can be added to on day trips or in easy rapids. Carrying more than two paddlers in an open canoe when running rapids is not recommended.

X1.1.2.8 *Car-top racks* shall be strong and attach positively to the vehicle. Lash your boat to each crossbar, then tie the ends of the boats directly to the bumpers for added security. This arrangement should survive all but the most violent vehicle accident.

X1.1.3 *Group Preparedness and Responsibility*

X1.1.3.1 *Organization.* A river trip should be regarded as a common adventure by all participants, except on instructional or commercially guided trips as defined below. Participants share the responsibility for the conduct of the trip, and each participant is individually responsible for judging his or her own capabilities and for his or her own safety as the trip progresses. Participants are encouraged (but are not obligated) to offer advice and guidance for the independent consideration and judgment of others.

X1.1.3.2 *River Conditions.* The group should have a reasonable knowledge of the difficulty of the run. Participants should evaluate this information and adjust their plans accordingly. If the run is exploratory or no one is familiar with the river, maps and guidebooks, if available, should be examined. The group should secure accurate flow information; the more difficult the run, the more important this will be. Be aware of possible changes in river level and how this will affect the difficulty of the run. If the trip involves tidal stretches, secure appropriate information on tides.

X1.1.3.3 *Group equipment should be suited to the difficulty of the river.* The group should always have a throwbag available, and one line per boat is recommended on difficult runs. The list may include carabineers, prussic loops, first aid kits, flashlights, folding saws, fire starter, guidebooks, maps, food, extra clothing, and any other rescue or survival items suggested by conditions. Each item is not required on every run, and this list is not meant to be a substitute for good judgment.

X1.1.3.4 *Keep the group compact,* but maintain sufficient spacing to avoid collisions. If the group is large, consider dividing into smaller groups or using the “buddy system” as an additional safeguard. Space yourselves closely enough to permit good communication, but not so close as to interfere with one another in rapids.

(1) A *point paddler* sets the pace. When in front, do not get in over your head. Never run drops when you cannot see a clear route to the bottom or, for advanced paddlers, a sure route to the next eddy. When in doubt, stop and scout.

(2) *Keep track of all group members.* Each boat keeps the one behind it in sight, stopping if necessary. Know how many people are in your group and take head-counts regularly. No one should paddle ahead or walk out without first informing the group. Paddlers requiring additional support should stay at the center of a group and not allow themselves to lag behind in the more difficult rapids. If the group is large and contains a wide range of abilities, a “sweep boat” may be designated to bring up the rear.

(3) *Courtesy.* On heavily used rivers, do not cut in front of a boater running a drop. Always look upstream before leaving eddies to run or play. Never enter a crowded drop or eddy when no room for you exists. Passing other groups in a rapid may be hazardous; it’s often safer to wait upstream until the group ahead has passed.

X1.1.3.5 *Float Plan.* If the trip is into a wilderness area or for an extended period, plans should be filed with a responsible person who will contact the authorities if you are overdue. It may be wise to establish checkpoints along the way where

civilization could be contacted if necessary. Knowing the location of possible help and planning escape routes can speed rescue.

X1.1.3.6 *Drugs.* The use of alcohol or mind-altering drugs before or during river trips is not recommended. It dulls reflexes, reduces decision-making ability, and may interfere with important survival reflexes.

X1.1.3.7 *Instructional or commercially guided trips.* In contrast to the common adventure trip format, in these trip formats, a boating instructor or commercial guide assumes some of the responsibilities normally exercised by the group as a whole, as appropriate under the circumstances. These formats recognize that instructional or commercially guided trips may involve participants who lack significant experience in white-water. However, as a participant acquires experience in whitewater, he or she takes on increasing responsibility for his or her own safety, in accordance with what he or she knows or should know as a result of that increased experience. Also, as in all trip formats, every participant shall realize and assume the risks associated with the serious hazards of whitewater rivers.

X1.1.3.8 It is advisable for instructors and commercial guides or their employers to acquire trip or personal liability insurance.

(1) An “instructional trip” is characterized by a clear teacher/pupil relationship, where the primary purpose of the trip is to teach boating skills, and which is conducted for a fee.

(2) A “commercially guided trip” is characterized by a licensed, professional guide conducting trips for a fee.

X1.1.4 *Guidelines for River Rescue*

X1.1.4.1 *Recover from an upset with an Eskimo Roll* whenever possible. Evacuate your boat immediately if there is imminent danger of being trapped against rocks, brush, or any other kind of strainer.

X1.1.4.2 *If you swim, hold on to your boat.* It has significant flotation and is easy for rescuers to spot. Get to the upstream end so that you cannot be crushed between a rock and your boat by the force of the current. Persons with good balance may be able to climb on top of a swamped kayak or flipped raft and paddle to shore.

X1.1.4.3 *Release your craft if this will improve your chances,* especially if the water is cold or dangerous rapids lie ahead. Actively attempt self-rescue whenever possible by swimming for safety. Be prepared to assist others who may come to your aid.

(1) *When swimming in shallow or obstructed rapids,* lie on your back with feet held high and pointed downstream. Do not attempt to stand in fast moving water; if your foot wedges on the bottom, fast water will push you under and keep you there. Get to slow or very shallow water before attempting to stand or walk. Look ahead! Avoid possible pinning situations including undercut rocks, strainers, downed trees, holes, and other dangers by swimming away from them.

(2) *If the rapids are deep and powerful,* roll over onto your stomach and swim aggressively for shore. Watch for eddies and slackwater and use them to get out of the current. Strong



FIG. X1.1 Stop: Potential Hazard Ahead

swimmers can affect a powerful upstream ferry and get to shore fast. If the shores are obstructed with strainers or undercut rocks, however, it is safer to “ride the rapid out” until a safer escape can be found.

X1.1.4.4 *If others spill and swim, go after the boaters first.* Rescue boats and equipment only if this can be done safely. While participants are encouraged (but not obligated) to assist one another to the best of their ability, they should do so only if they can, in their judgment, do so safely. The first duty of a rescuer is not to compound the problem by becoming another victim.

X1.1.4.5 *The use of rescue lines requires training;* uninformed use may cause injury. Never tie yourself into either end of a line without a reliable quick-release system. Have a knife handy to deal with unexpected entanglement. Learn to place set lines effectively, to throw accurately, to belay effectively, and to properly handle a rope thrown to you.

X1.1.4.6 *When reviving a drowning victim,* be aware that cold water may greatly extend survival time underwater. Victims of hypothermia may have depressed vital signs so they look and feel dead. Don’t give up; continue CPR for as long as possible without compromising safety.

X1.2 Hand Signals

X1.2.1 Examples of Swiftwater Hand Signals¹⁰

¹⁰ All images and descriptions in X1.2 have been used with the permission of American Whitewater. These images and descriptions can be found at the following URL: <http://www.americanwhitewater.org/content/Wiki/safety:start>

X1.2.1.1 *Stop: Potential Hazard Ahead*—(See Fig. X1.1.) Wait for “all clear” signal before proceeding, or scout ahead. Form a horizontal bar with your outstretched arms. Those seeing the signal should pass it back to others in the party.

X1.2.1.2 *Help/Emergency*—(See Fig. X1.2.) Assist the signaler as quickly as possible. Give three long blasts on a police whistle while waving a paddle, helmet or life vest over your head. If a whistle is not available, use the visual signal alone. A whistle is best carried on a lanyard attached to your life vest.

X1.2.1.3 *All Clear – Come Ahead* (in the absence of other directions proceed down the center)—(See Fig. X1.3.) Form a vertical bar with your paddle or one arm held high above your head. Paddle blade should be turned flat for maximum visibility. To signal direction or a preferred course through a rapid around obstruction, lower the previously vertical “all clear” by 45° toward the side of the river with the preferred route. Never point toward the obstacle you wish to avoid.

X1.2.1.4 *I’m Okay: I’m Okay and Not Hurt*—(See Fig. X1.4.) While holding the elbow outward toward the side, repeatedly pat the top of your head.

X1.3 Whistle Commands

X1.3.1 Examples of Whistle Command Signals

X1.3.1.1 *One Blast*—Stop or attention; look at person blowing the whistle if safe to do so.

X1.3.1.2 *Two Blasts*—Look up stream or move up stream.

X1.3.1.3 *Three Blasts*—Look down stream or move down stream.

X1.3.1.4 *Three Long Blasts, Repeated*—Emergency, danger, distress, or help needed.



FIG. X1.2 Help/Emergency

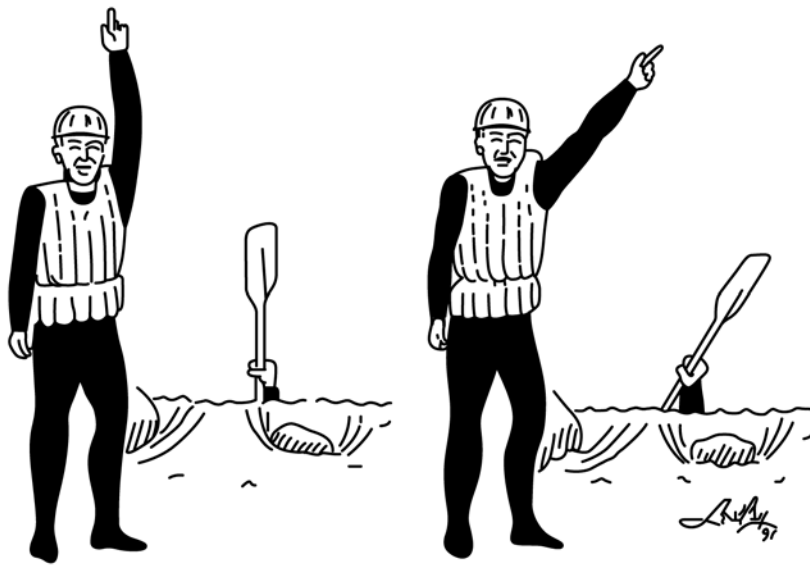


FIG. X1.3 All Clear - Come Ahead



FIG. X1.4 I'm Okay

X2. EXAMPLES FOR MINIMUM STANDARD TESTING

X2.1 Examples for Minimum Standard Testing

X2.1.1 Physical fitness standards for a Swiftwater/Flood Rescue Technician Basic (SWFT-Basic) should be commensurate with the anticipated response and operating environment(s) and threats identified in the hazard assessment.

X2.1.2 Several examples of levels of fitness are being used in the Swiftwater environment, including, but not limited to, the following:

X2.1.2.1 *United States Lifesaving Association (USLA)*¹¹—

(1) The United States Lifesaving Association has maintained a minimum swim standard since 1980 that shall be met and maintained by all open water rescuers in USLA certified

programs, which is 500 m in 10 min or less over a measured course. The ability to swim this distance within this timeframe is one that shall be met and maintained throughout the rescuer's assignment to open water rescue work (i.e., regularly tested). The USLA does not prescribe the environment for the test (e.g., pool, lake, ocean, water temperature, surf conditions, etc.). The USLA standards also include the requirement that all open water rescuers are trained locally by the authority having jurisdiction (AHJ) in a course involving at least 21 h in first aid, plus cardiopulmonary resuscitation for professional rescuers, plus a 40 h rescue course that meets the curriculum requirements of USLA. Higher training standards are encouraged and recognized. The USLA maintains a current list of agencies certified in meeting these standards on its website at: www.usla.org.

¹¹ United States Lifesaving Association, <http://www.usla.org/>

X3. RECOMMENDATIONS FOR MINIMUM CUSTOMIZATION EQUIPMENT

X3.1 Recommendations for Minimum Customization Equipment for Rescuer Safety

X3.1.1 A Swiftwater/Flood Rescue Technician Basic (SWFT-Basic) requires water rescue personal protective equipment (PPE), including minimum customization equipment.

X3.1.2 A whistle and cutting device (scissors or knife) are identified as customization equipment.

X3.1.3 Additional examples of customization equipment include, but are not limited to, the following:

X3.1.3.1 Locking carabineers (at least two are recommended);

X3.1.3.2 Webbing;

X3.1.3.3 Waterproof light(s);

X3.1.3.4 Rope (low stretch, strong, resist abrasion and environmental factors (ultraviolet light, avoid water absorption, and float);

X3.1.3.5 Leak proof dye marker;

X3.1.3.6 Gloves;

X3.1.3.7 Goggles;

X3.1.3.8 “O” Ring(s);

X3.1.3.9 Map(s);

X3.1.3.10 Compass; and

X3.1.3.11 Global positioning system (GPS).

X4. ADDITIONAL SWIFTWATER/FLOOD RESCUE DEFINITIONS

X4.1 Additional Definitions

X4.1.1 *boat-assisted*—Swiftwater/flood search and rescue operations aided by a boat, in which the boat is operated on tether.

X4.1.2 *boat-based*—Swiftwater/flood search and rescue operations performed by a boat only.

X4.1.3 *buoyancy aid*—a device that is not U.S. Coast Guard (USCG) approved, suitable for use by one person to stay afloat in a water emergency. A buoyancy aid may be a rescue tube or can.

X4.1.4 *far shore*—the side of the watercourse opposite the near shore.

X4.1.5 *wide area flood event*—any flood event by which local jurisdiction resources may be fully utilized and/or exhausted and by which mutual aid or specialized flood response teams/resources are needed and/or required. This includes flood events with extensive flood rescue operations that are simultaneously occurring in, or impacting, more than one jurisdictional area.

X4.1.5.1 *localized flood event*—any flood event by which local jurisdiction resources can respond and conduct respective operations without the need of non-typical mutual aid or outside-of-jurisdiction resources. While these events may have simultaneous rescue operations during the course of such, the event and responses are typically within one jurisdiction.

X4.1.5.2 *jurisdictional linked flood event*—any flood event by which local jurisdictions have pre-identified and assembled a joint management and response system that is activated during the event. These types of events are typically found in urban areas and where rivers, streams, washes, canals, arroyos, or storm-water management systems pass from one jurisdiction to another in a limited but well-defined area.

X4.1.5.3 *flash flood*—a sudden localized or wide area flood event of great volume and short duration typically caused by unusually heavy rain affecting a defined geographical and/or topographical area. A flash flood often features high velocity attributes and can often carry large loads of mud, rock, and man-made debris.

X4.1.5.4 *fluvial flooding*—flooding that occurs in the floodplain or water shed of a defined water course (stream, creek, or river) when the capacity of the course is exceeded by rainfall or snow/ice melts in the upstream catchment areas.

X4.1.5.5 *pluvial flooding*—surface water flooding that is caused by rainwater runoff typically found or occurring in urban areas or areas that possess land with low water absorptency.

X4.1.5.6 *tidal fooding/storm surge*—flooding as a result of abnormally high tides, strong winds, or significant low-pressure fronts that cause sea levels to rise above normal levels.

X4.1.6 *helicopter-based*—Swiftwater/flood search and rescue operations conducted by a helicopter crew that intends to make direct contact with the subject(s) while remaining airborne.

X4.1.7 *in-water contact*—Swiftwater/flood search and rescue operations conducted by rescuers in the water who make direct contact with the subject(s).

X4.1.8 *near shore*—the side of the watercourse where operations or IC may occur.

X4.1.9 *rescue basket (also litter or stretcher)*—a secure and protected conveyance for the sick or injured victim(s) that is intended for lifting an individual from the ground or water in a safe and secure manner.

X4.1.10 Rescue Boats and Types

X4.1.10.1 *inflatable boat*—a lightweight vessel with a flexible lower hull, a rigid transom, and sides and bow made of flexible tubes containing pressurized gas (usually air).

X4.1.10.2 *rigid hull boat*—a vessel with an inflexible hull and no inflatable components.

X4.1.10.3 *rigid hull inflatable boat (RHIB) or rigid buoyant boats (RBB)*—a vessel with an inflexible lower hull, whose topsides are made of flexible tubes containing pressurized gas (usually air) or a foam-filled collar.

X4.1.11 Rescue Devices

X4.1.11.1 *longboard*—an extra-long surfboard or paddleboard.¹²

X4.1.11.2 *paddleboard*—a long narrow surfboard.¹³

X4.1.11.3 *boogie board*—a short, lightweight surfboard often ridden by rescue personnel lying prone; also called *body board*.¹⁴

X4.1.11.4 *rescue hoist*—a mechanical lifting device that is certified for, and capable of, lowering and raising a human load.¹⁵

X4.1.12 *river left*—the direction to the left, when facing downstream on a watercourse.

X4.1.13 *river right*—the direction to the right, when facing downstream on a watercourse.

X4.1.14 *short-haul*—to transport one or more persons suspended on a fixed line beneath a helicopter.¹⁶

X4.1.15 *throw coil*—a length of rope that is coiled in a ready state and thus requires no container. The floating rope should be able to withstand a minimum load of 1,000 lb before breaking.

X4.1.16 *trail line/tag line*—a cord or lightweight rope manipulated from the ground that is used to guide and control a load hoisted or raised from above.

X4.1.17 *upstream*—the direction opposite to downstream in a watercourse.

¹² <http://dictionary.reference.com/browse/longboard?s=t>. Accessed February 7, 2013; definition has been adapted to fit requirements.

¹³ <http://dictionary.reference.com/browse/paddleboard>. Accessed September 13, 2013.

¹⁴ <http://dictionary.reference.com/browse/Boogie+Board>. Accessed February 7, 2013.

¹⁵ Emergency Helicopter Extraction Source List – 2012, [http://www.fs.fed.us/fire/aviation/av_library/Revision%205-EHE%20Source%20List%20\(01-12\).pdf](http://www.fs.fed.us/fire/aviation/av_library/Revision%205-EHE%20Source%20List%20(01-12).pdf).

¹⁶ Emergency Helicopter Extraction Source List – 2012, [http://www.fs.fed.us/fire/aviation/av_library/Revision_6_EHE_Source_List\(03-12\).pdf](http://www.fs.fed.us/fire/aviation/av_library/Revision_6_EHE_Source_List(03-12).pdf).

X5. SUMMARY TABLE OF QUALIFICATIONS OF KNOWLEDGE, SKILLS, AND EXPERIENCE

General Knowledge, Qualifications, and Training			
SWFT personnel shall have the following knowledge, qualifications, and training:	Basic	Intermediate	Advanced
Federal Emergency Management Agency (FEMA) and NIMS training or equivalent, to include the following:	✓		
ICS-100.b (ICS 100): Introduction to ICS;	✓		
ICS-200: ICS for Single Resources and Initial Action Incidents;	✓		
FEMA IS-700.A: NIMS, An Introduction;	✓		
FEMA IS-800.B: National Response Framework (NRF), An Introduction; and	✓		
Basic Aircraft Safety (A-101), or equivalent.	✓		
Department of Interior, Office of Aviation Management (DOI OAM), B-3 Course, Combination Helicopter/Airplane Safety, or equivalent.		✓	
Hazardous materials (HazMat) awareness level training as required by OSHA (include additional info on course), or equivalent.	✓		
Bloodborne/Airborne Pathogens training.	✓		
Urban/wilderness interface considerations.	✓		
Physical fitness standards as established and required by the AHJ.	✓		
The AHJ will require a swim test commensurate with the environment that the SWFT will operate in. These standards should be commensurate with the anticipated response and operating environment(s) and threats identified in the hazard assessment. Swiftwater rescue requires a high level of fitness to safely perform arduous work in difficult environmental conditions.		✓	
Emergency medical skills, including basic first aid and Cardiopulmonary Resuscitation (CPR), as established and required by the AHJ.	✓		
Depending on the geography of the AHJ, the AHJ may require the SWFT to have rope skills in accordance with Guide F2752.	✓		
Be familiar with the Safety Code of American Whitewater (refer to X1.1).	✓		
Be familiar with the visual and audible river signals (refer to X1.2 and X1.3).	✓		
Understand agency policy and agency water-relevant standards, objectives, and goals.	✓		
Team roles and responsibilities.	✓		
Establishing point last seen (PLS) by a witness/last known point (LKP).	✓		
Procedures for interviewing witnesses.	✓		
Navigation, including the following:			
General use of maps, compasses and GPSs, as required by the AHJ.	✓		
Hazard recognition (Could include, but not limited to: ineffective team communication, changing conditions, lack of command and control, multi-agency efforts without coordination, night operations, improvised techniques, high water flows, strainers, flood debris, cold water, hydraulics, low-head dams, multiple patients, multiple incidents, air temperature extremes, man-made obstacles, and debris.).	✓		
SWFT/flood/hazard pre-planning and notification systems.	✓		
Safety, including the following:			
Generally safe work area zones;	✓		
Pollution, hygiene, and decontamination;	✓		
Heat escape lessening posture/position (HELP);	✓		
Huddle position; and	✓		
Self-rescue/swimmer position.	✓		
Water/Environmental Hydrology, including the following:	✓		
Water temperature and effects;	✓		
Current/flow/Cubic Feet per Second (CFS)/force/features, such as eddies, holes, etc.;	✓		
Contaminants;	✓		

Hazards, including but not limited to: strainers, sieves, weirs/low head dams, under cuts, debris/loads, ineffective team communication, changing conditions, lack of command and control, multi-agency efforts without coordination, night operations, improvised techniques, high water flows, strainers, flood debris, cold water, hydraulics, low-head dams, multiple patients, multiple incidents, air temperature extremes, man-made obstacles and debris;	✓		
Ice, mud, banks;	✓		
Weather and related effects; and	✓		
Tide and related effects.	✓		
Physiology of drowning, including the following:			
Basic survivor care;	✓		
Immersion shock/cold water reflex; and	✓		
Hypothermia/hyperthermia.	✓		
Water rescue personal protective equipment (PPE) and:			
• Donning;	✓		
• Doffing; and			
• Care.			
Minimum customization equipment, such as a whistle, a cutting device (scissors or knife attached to a lanyard), etc., as required by the AHJ.	✓		
Flotation devices/personal flotation devices (PFDs)/types and uses, including the following:			
Wet/Dry/Ice suit;		✓	
Thermal protection;	✓		
Helmet;	✓		
Waterproof lighting;	✓		
Gloves and footwear;	✓		
Throw bag and other throwing devices, as appropriate;	✓		
Reaching devices;	✓		
Other ancillary/adjunct devices, such as boards, ladders, floats; and		✓	
Design and limitations of devices.	✓		
Self-awareness, including limitations.	✓		
Cognitive and practical understanding of the following:			
Talking rescue techniques;	✓		
Self-rescue techniques;	✓		
Reaching rescue techniques;	✓		
Throwing rescue techniques;	✓		
Wading rescue techniques;		✓	
Swimming rescue techniques;		✓	
Night rescue considerations and operations;	✓		
Identifying need for additional assistance and how to request it; and	✓		
Annual refresher/maintenance training including: TBD	✓		

Skills and Abilities Specific to Swiftwater/Flood Rescue			
SWFT personnel shall demonstrate cognitive and practical understanding of the following:	Basic	Intermediate	Advanced
Huddle position;	✓		
Donning and doffing of relevant PPE;	✓		
Self-rescue techniques;	✓		
Throwing techniques;	✓		
Reaching rescue techniques;	✓		
Throwing rescue techniques.	✓		
Wading rescue techniques;		✓	
Swimming rescue techniques.		✓	
Rescue board use in Class 4+ rivers;			✓
Tethered swimmer rescue techniques;			✓
Multiple victim rescue operations;			✓
Victims trapped in vehicles;			✓
Injured victim extrication from river;			✓
Incorporation of complex rope rescue systems in moving water operations, such as tension diagonal, boat on track line, two and four tether on boat, and channel rescue techniques;			✓
Night rescue operations.			✓
Boat pins/wraps/entrapments;			✓
Limb entrapments in wilderness [trees/rock sieves] and urban [fences/gates] environments;			✓
Special equipment as identified and used by the AHJ such as fire hose, and rope launching devices.			✓

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