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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.

1.6 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

¹ This guide 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. Referenced Documents

2.1 *ASTM Standards:*²

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 Basic Rope 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

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.

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>

3.1.13 *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

3.1.17 *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 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 techniques.

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%20281118111%29%20-%20Bookmark.pdf

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;

5.1.1.2 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 GPS; 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 (for example, eddies, holes, etc.);

5.2.10.3 Contaminants;

5.2.10.4 Hazards, including: strainers, sieves, weirs/low-head dams, undercuts, 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, tubes, and rafts.

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

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:

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

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