Rationale and Background

The ASRC is a multistate ground search and rescue organization in the mid-Appalachian region. ASRC Groups must meet group requirements for membership but members of ASRC Groups are also considered members of the ASRC, and must meet fairly stringent ASRC standards (rather than just Group standards) for certification at various levels; the most relevant to this discussion are the Field Team Member and Field Team Leader standards. These are specified in the ASRC Training Standards, available online at www.asrc.net.

The ASRC does not have standards for cave rescue training, but has long had a cooperative agreement with Eastern Region, National Cave Rescue Commission to provide above-ground support for cave rescues.

The National Cave Rescue Commission (NCRC) is a training and resource coordination organization, but is not at all a response organization. NCRC is a nationally-recognized source of high-quality cave rescue training. However, neither NCRC training standards nor NCRC curricula are available outside of a tightly-restricted circle of NCRC instructors.

For a team to become a member of the MRA, the team must have a certain number of members with certain broadly-defined capabilities, and teams must also pass a team test. This test involves search, vertical rescue, and snow-and-ice techniques. MRA certified teams are internationally-recognized as having an elite level of wilderness search and rescue capability.

Some cave rescue teams in the southeast USA have levels of training and team capacities similar to those of MRA-certified teams, but in this area, there is no need for snow-and-ice training or capacity. There has been some interest both from the MRA and from these cave rescue teams in having these teams join the MRA as full member, but with cave rescue testing substituted for snow-and-ice rescue.

The Allegheny Mountain Rescue Group (AMRG) is a member Group of the Appalachian Search and Rescue Conference (ASRC) in Pittsburgh, PA, and is a full certified team of the Mountain Rescue Association (MRA).

AMRG considers itself not only a mountain rescue team but also a cave rescue team, at least for a first response. A number of AMRG members are cavers who have completed various levels of NCRC training. The local caving organizations also have many experienced cavers, some also with NCRC training, who can respond for a cave rescue, augmenting AMRG member capabilities.

The ASRC’s Mountaineer Area Rescue Group, about an hour’s drive south of Pittsburgh in the Morgantown, WV area, is not certified by the MRA but also considers itself a cave rescue team.

Both AMRG and MARG strongly recommend that members with an interest in cave rescue attend the Level 1 and Level 2 training programs. However, there are certain bars to using this training for all interested members:

- Taking an NCRC Level 1 or Level 2 course requires a large time commitment: 9 days off work, plus a day at either end for travel
- Taking an NCRC course is expensive.
- Much of NCRC Level 1 and 2 training duplicates training required of ASRC FTM and FTL training.
The last may actually be seen as benefit rather than a drawback for certain members. For a new AMRG member who is gung-ho, but wants to train up to FTM and then FTL as quickly as possible, we recommend NCRC Level 1 and then Level 2 training as a quick way to get ~80% of what they need to know for FTM and FTL in an intensive, sink-or-swim environment. However, for members who already have FTM or FTL certification, this represents a large burden in terms of time and money for less benefit.

AMRG, in an attempt to improve its cave rescue capacity, is working on training and testing standards for AMRG members. These will be used to craft team training, likely in concert with MARG, specifically designed to get members more capable for cave rescue at the FTM and FTL.

We plan to vet these draft standards through multiple venues to improve them. We will consult interested people within the MRA and ASRC, and NCRC instructors and staff.

These standards may serve other purposes as well. If the ASRC sees fit to accept them, they might become an addition to the ASRC Training Standards.

A related issue is ASRC member testing; one of the services the ASRC plans to offer to its member Groups is that of standardized testing. In this electronic age, it might even be possible that the ASRC could provide Groups such standardized testing not only for the base FTM and FTL standards, but also for additions such as these cave rescue standards, or other standards.

If the MRA decides to accept cave rescue as a specialty like snow-and-ice, they might serve as a model for that purpose as well.

Training Levels

Many emergency services organizations and agencies organize training/certification into four (or sometimes just three, leaving out Specialist) levels. Here is a slightly tongue-in-cheek take on what each level means.

**Awareness**: understands a little bit, enough to stay out of the way but not actually do anything to help with the specific rescue discipline. Usually an evening lecture course, with no practical experience.

**Operations**: Knows enough to actually do simple rescues in the discipline without killing anyone. Probably. Usually about a week of training, minimum.

**Technician**: Pretty competent. Can handle a fairly complex rescue in the discipline. Very unlikely to get anyone killed. Usual minimum two weeks of intensive training, in addition to Operations.

**Specialist**: A guru. Knows all sorts of esoterica useful for cocktail party conversation and some good party tricks related to the discipline. Usually requires a full month or likely a lot more of training in addition to Technician training. Is the sort of person you really want to have running a rescue in the discipline.

I'm not sure who originally came up with these terms, but regardless, they seem to be sticking. At least they are vogue until something better comes along.

Part of our problem is that we already have training levels for the Appalachian Search and Rescue Conference, our parent body, and some separate additional ones for our particular Group from the Mountain Rescue Association, of which we are a full member. There is some discussion of getting rid of the "member/leader" titles and switching to something more in line with emerging emergency services standards.

These are as follows. The detailed requirements are in the ASRC Training Standards, available online at:


I will paraphrase these succinctly:

**Callout Qualified (CQ)**: won't get killed going out on an operation. Probably. Similar to Awareness level but can
go into the field for training, and maybe to help out a bit on a mission.

**Field Team Member:** Basic level of qualification. Gets field promoted to lead teams of relatively untrained volunteers on a regular basis. Similar to Operations level.

**Field Team Leader:** Top level of generic SAR capabilities. Similar to Technician level.

Everything after this is a specialist of some sort: vertical rescue, medical, tracking, search and rescue management.

The Mountain Rescue Association has traditionally had just two types of individual qualifications: **Support** and **Rescue**. More recently this has been starting to morph so that **Support = Operations** and **Rescue = Technician** (MRA National Compliancy Guideline, Policy 105.1). The AMRG MRA individual standards are much more specific than the national MRA policy.

What about NCRC training? Though NCRC standards are not publicly available, these classes set a defacto standard. For that we have:

**Orientation to Cave Rescue:** this one weekend class is more than Awareness, but not at what we usually think of as the Operations level. Maybe "Heightened Awareness." Can do horizontal rescues with close supervision. Unlikely to kill self if you're lucky.

**Level 1:** this fits pretty well with the Operations Level in other rescue disciplines. 9-day intensive course, with prerequisites of baseline vertical caving competence.

**Level 2:** this fits pretty well with the Technician Level in other rescue disciplines. Another 9-day intensive course.

**Level 3:** Fits with the Specialist level in other rescue disciplines.

Comparing directly in a single document offers an opportunity to review the ASRC FTM and FTL standards and the AMRG MRA standards as well as the proposed new cave rescue standards, and even to try to harmonize the various standards so they fit together better. However, the current process is solely to devise additional cave search and rescue standards for AMRG.

It also may be true that some of the information in the standards is more detailed than should be in standards used for training and testing (for instance, specifying where the knot should be in a wrap-3, pull-2 anchor). This may be due to the lack of accepted standard ASRC reference materials that provide the “correct” or “book” methods to execute certain techniques. I am working on a textbook that may remedy this, of which two chapters are currently available; see [conovers.org/ftp/SAR-Evacs.pdf](conovers.org/ftp/SAR-Evacs.pdf) for a relevant chapter, which includes things such as knots, belaying, rappelling, and ascending. Having this reference material for an official way to perform various tasks may make revising standards easier, as there will be less pressure to specify what is “correct” in the standards.

**Cavers vs. Noncavers**

This is a delicate topic that comes up with any wilderness search and rescue team. One of the prerequisites for doing search and rescue is being comfortable in the wilderness, and being able to get around in it. Indeed, many wilderness search and rescue teams only accept members who have significant experience in the outdoors.

Dedicated cave rescue teams tend to be the same way. If you're not a hard-core caver, don't bother applying.

But AMRG, even though we have some fairly hard-core cavers, is **not** a dedicated cave rescue team, it's a combined mountain and cave rescue team.

There’s something called the 80% rule. Those of us involved in both cave and mountain rescue have
observed that about 80% of it is the same, above- or below-ground. Knowing about search principles, survival issues including hypothermia, basic litter carrying, belaying a litter, knots... that's why we tell new gung-ho people to take an NCRC Level 1 class, as it's a very intense way to get about 80% of what you need for ASRC FTM and some of the stuff for FTL.

The same 80% rule likely applies for outdoor/caving experience. If you're an experience outdoorsperson, you've got about 80% of what you need to be a caver, and vice versa.

Everyone in AMRG is comfortable in the outdoors aboveground. It won't take much for the non-cavers to spend some time underground and become adequately-experienced cavers. Indeed, we've had a number of cave trips just for familiarization, and quite a few of our above-ground members, but human and canine, have now become cavers. (The dogs love caving; they say it's more fun than rappelling down a cliff.)

But I suspect that there will be some members who, while quite competent in the outdoors above-ground and at SAR, will not want to go in caves.

Which brings up the question of cave awareness. The NFPA 1670 specifies that a rescue organization can be "Cave Aware": knows a little about cave rescue, enough to do some above-ground work, but doesn't go underground. The same could be said of some members of a cave rescue team like ours: they are cave-aware but don't go underground.

It's reasonable to argue that all of our members should be "cave-aware." To do this, members need to have an appreciation mostly for the cave environment, and a little bit about the specifics of cave search and rescue.

Some people don't like caving, and don't want to go underground, but are fine with above-ground search and rescue. Do we have to tell these people they can't be AMRG members? No.

It's reasonable to require them to get to the "awareness level": knowing a bit about caves, and cave rescue, so as to be able to help above-ground. This would fit with adding some cave SAR to FTM but not requiring vertical or in-cave experience.

(But note that, for AMRG, which is an MRA team there are additional requirements for FTM and FTL above the ASRC standards.)

There could be a requirement to participate in cave rescues or simulations, but such members could gain credit for this while just serving on the surface.

That means that the additional cave rescue requirements for FTM would apply to all AMRG members.

But once you get to the FTL level, it makes more sense to branch into cave/noncave versions. We could ID those FTLs that meet the additional cave rescue FTL standards, and those are preferentially sent underground.

This is probably a good place to note that anyone with any experience at cave SAR realizes that experienced cavers are the single most important resource. Our local Grottoes will be alerted through AMRG (which does local alerting for NCRC) to send their experienced cavers, and we have a plan to integrate them into the rescue even though they're not officially AMRG members. Of course we and the Grottoes encourage all members to take at least OCR and preferable a Level 1 or Level 2 NCRC class.

**Personal Vertical Skills**

ASRC FTM doesn't require vertical skills. ASRC FTL requires minimal vertical skills. NCRC OCR requires no vertical skills, but NCRC Level 1 and Level 2 emphasize vertical skills. Indeed, to get into Level 1, you have to pass a pretest on knots, and be able to ascend a free-hanging rope 10 meters, change over to rappel, descend, and then change back to ascenders and down-climb. NFPA Level 1 requires essentially the same vertical skills as for NCRC Level 1 (after which it is modeled).
The FEMA resource personnel typing for a Cave Rescue Team requires rappelling, ascending and changeover on-rope, even for the minimal Type IV Cave Rescue Team.

At least in my personal experience, many cave searches and rescues involve lots of horizontal caving, which can be done with no need for any vertical skills except maybe a short belay or a cable ladder climb. Therefore, cavers or search and rescue team members with some cave search and rescue training, yet who don’t want to do vertical caving, can still contribute significantly to the effort underground.

And, since the ASRC FTM (or perhaps Operations Level if it’s changed to that) requires no vertical skills, adding some cave-SAR-specific stuff to FTM, but not requiring vertical skills, makes perfect sense for us. This doesn’t fit at all with the NCRC/NFPA model, which emphasizes vertical skills, but it fits well with the ASRC model, and will allow us to be a more effective cave SAR team than if we refused to allow those lacking vertical skills to do horizontal cave rescue.

We’ll probably need a Specialist level to encourage people to develop their vertical caving and cave rescue skills to where they can help do complex rescues involving rebelay and the like, but that can come after we’ve got the basics worked out.

This is all somewhat complicated by the fact that AMRG is a MRA-certified team, and that AMRG FTMs and FTLs are required to meet additional Group standards in this regard. This Group standards meet or exceed the MRA national standards.

For ease of use, the cave rescue additions are in **bold red text** the AMRG mountain rescue additions are in **blue italic text**, and additions that are common to both are in **purple bold italic text**. I have modified the wording of the AMRG MRA standards slightly when needed to fit with the format of the ASRC standards, but have not changed the essence of them.

Field Team Member

**ASRC Operations, MRA/AMRG Support/Operations, Cave Awareness**

**Cave Extensions required for all AMRG FTMs**

Field Team Member standards define the minimum requirements necessary to perform as a member of an organized search team for a missing person search, the ground portion of missing aircraft search, a cave search and non-technical and semi-technical rescues both above-ground and in caves.

A. Qualifications

To become a Field Team Member (FTM), the applicant must:

1. Be an Active Member of the ASRC, as specified by the ASRC Bylaws;
2. Have met all the requirements as a CQ member;
3. Participate satisfactorily in four ASRC or Group training sessions, including sessions on Personal Wilderness Survival, cave search and rescue and basic ground search theory, as judged by the Group Training Officer;
4. Meet the technical standards listed below, as judged by the Group Training Officer;
5. Successfully pass a standard ASRC FTM written test and complete the standard ASRC FTM skills evaluation checklist, as verified by the Group Training Officer;
6. Be proposed for membership by the Group Training Officer at a group business meeting and receive a simple majority of the vote.
7. Have successfully completed the following FEMA Courses:
   a. IS-200, ICS for Single Resources and Initial Action Incidents
8. Have successfully completed the following courses:
   a. IS 5, an Introduction to Hazardous Materials, NFPA 472 HazMat Awareness and/or OSHA 1910.120(Q)(6)(i), HazMat Awareness Training or equivalent
   b. Department of Interior B-3 Combination Helicopter/Airplane Safety or equivalent
   c. Bloodborne Pathogens Awareness or equivalent (All medical providers at the First Responder level or higher are considered to have the equivalent training for this requirement).
9. Hold a current American National Red Cross Standard First Aid card or equivalent, or higher certification.
10. Hold a current AHA CPR for Health Care Provider certification, or equivalent.

Field Team Members must meet annual continuing education requirements and maintain skills proficiency by participating in a minimum of six training sessions and respond to a minimum of two incidents per year.

B. Recertification

Field Team Members must meet the following recertification requirements every three calendar years following their date of initial certification:

1. Document participation for a minimum of 6 SAR missions that are ground SAR incidents for either missing persons or missing aircraft or cave search and rescue. Simulations may be counted toward recertification requirements. At least one of these must be a cave search and rescue operation or simulation, but the member need not go underground.
2. Hold a current American National Red Cross Standard First Aid card or equivalent, or higher certification.
3. Hold a current AHA CPR for Health Care Provider certification, or equivalent.
4. The review cycle period shall begin the first January of the year following the initial certification.
5. Document successful completion of training across the entire range of ASRC training standards for the level of certification the member wishes to retain. Based on the member’s documentation and any other means such as, but not limited to, testing, the GTO must validate and certify that the member has successfully demonstrated proficiency for each of the following training areas listed in the ASRC training standards under “Knowledge and Performance Specifications” (FTM).
   a. SAR Operations
   b. Legal Aspects of SAR Operations
   c. Personal Equipment
   d. Wilderness Survival
   e. Land Navigation & Orienteering
   f. Search Skills
   g. Ropes and Technical Hardware
   h. Litter Handling Techniques
   i. Belay
   j. Field Team Organization
   k. Helicopter Operations
   l. Field Communications
   m. Wilderness Medicine
   n. attend a class on basic rope safety
   o. attend a class on semi-tech Stokes litter handling

6 AMRG Cave Rescue Standards Proposal
6. Each GTO has maximum flexibility to determine how best to accomplish and measure compliance with the training requirements. The time spent and method chosen will depend on many factors – subject, complexity, skill level of students, experience of instructor, availability of resources, etc. Ultimately, the method to achieve the standards and the length of time devoted to training really does not matter.

C. Equipment Requirements for Certification

To become an ASRC FTM, the application must demonstrate possession of the following personal equipment.

1. Appropriate clothes and footgear for both fair and foul weather including boots with lug soles;
2. Water container of one- to two-liter capacity;
3. Day pack (knapsack will be sufficient);
4. Five large, heavy-duty plastic trash bags;
5. Food for 48 hours;
6. Headlamp (or flashlight) and second light source;
7. Lighter, matches and candle, or equivalent WATERPROOF fire source;
8. Knife;
9. Compass;
10. Personal First Aid Kit;
11. WATERPROOF pen/pencil and paper;
12. Whistle;
13. Two pairs plastic or vinyl examination gloves;
14. Full-finger leather gloves;
15. Four-point suspension UIAA approved or equivalent helmet;
16. Eye protection;
17. Ear protection; and
18. (Medical gloves are on the MRA list but also included above, will need to reconcile this duplication).

D. Knowledge and Performance Specifications

1. SAR Operations
   a. Describe areas of responsibility for search and rescue as defined by the National SAR Plan.
   b. Describe areas of responsibility at the state level.
   c. List several resources that might be used during a SAR event.
   d. List several factors that may result in an aircraft being listed as missing.
   e. Describe the basic principles of the ICS and define the major staff positions as used in SAR.
   f. Describe the roles of Entrance Control during a cave search and rescue operation, and describe why those roles are important.

2. Legal Aspects of SAR Operations
   a. Define the terms "implied consent," "express consent," "Informed consent" and "abandonment."
   b. Define four facts necessary to prove negligence.
   c. Describe at least two methods of reducing liability exposure.
   d. Describe the circumstances when entry upon private property may be justified; define the problems involved with this action and possible solutions.
   e. Briefly explain how the following legal concepts apply to search and rescue operations:
      (1) suits and criminal actions;
Standards of care;
The right to emergency assistance and duties to provide emergency assistance;
Crime scene protection;
Declaration of death and confirmation of death; and
Confidentiality.

f. Outline basic principles of SAR ethics and public relations, including
   (1) Two basic principles for dealing with families
   (2) Two practical methods to help assure confidentiality and
   (3) Two principles for members when dealing with the media

3. Personal Equipment
   a. Explain these principles of clothing selection:
      (1) List two advantages and one disadvantage of waterproof clothing;
      (2) Explain the advantages and limitations of waterproof/breathable fabrics and softshell fabrics;
      (3) give one example of a clothing fabric that loses most of its warmth when wet and describe
      why, give two examples of clothing fabrics that retain most of their warmth when wet, and
      outline the implications for survival in cold, wet weather;
      (4) Define “layer principle” and list two reasons why this principle is applicable to dressing for SAR
      operations;
      (5) Define wicking and its roles in both cold and hot weather; and
      (6) Give a rationale for the winter-travel principle of “dressing cold.”

   b. Explain the selection principles for these items:
      (1) Boots;
      (2) Sleeping bag;
      (3) Ground protection and insulation;
      (4) Backpack/daypack;
      (5) Tent;
      (6) Personal safety items;
      (7) Fire starting aids;
      (8) Items for signaling and navigation;
      (9) Light sources and batteries;
      (10)Emergency shelters including the use of heat tents in caves; and
      (11)Stoves.

4. Wilderness Survival
   b. Describe several problems commonly encountered on SAR missions that may lead to a survival
      situation.
   c. Describe the psychological factors that may affect survival ability.
   d. Explain the "energy reserve" concept.
   e. Describe the body's physiologic response to both cold and heat stress.
   f. Define the following temperature-related diseases and their recognition, treatment and prevention:
      (1) Hypothermia;
      (2) Frostbite;
      (3) Trench foot (immersion foot);
(4) Heat stroke;
(5) Heat exhaustion; and
(6) Dehydration.
g. Demonstrate the ability to bivouac in any type weather conditions, without significantly affecting functional ability.
h. Define average daily food and water requirements.
i. Describe several ways to prevent excessive body heat loss. Describe the following concepts and their importance to maintaining body temperature.
   (1) The routes of heat loss and their relative importance;
   (2) The use of energy stores to produce heat, and the metabolic costs of shivering;
   (3) Vasodilation, sweating, and behavior means of increasing heat loss, and the long term consequences of them;
   (4) Vasoconstriction and behavior as a means of conserving heat;
   (5) The effects of tobacco and alcohol on normal heat homeostasis;
   (6) The particular danger of hypothermia weather.
j. Describe the hazards of the cave environment, including
   (1) regional differences in ambient cave temperature;
   (2) risk of flooding;
   (3) hypothermia;
   (4) bad air;
   (5) biological hazards including aerosol rabies and histoplasmosis; and
   (6) potential changes in the cave environment due to seasonal variations and outside weather.
k. Describe dangers to fragile aspects of the cave environment from cavers, and search and rescue personnel, including:
   (1) Dangers to geological features, including formations;
   (2) Dangers to biological features, including bats, with specific mention of White Nose Syndrome, and contamination from material brought into the care; and
   (3) The lack of weathering processes to ameliorate graffiti and other cave markings.
l. Describe and demonstrate effective methods for traversing wild areas safely and efficiently, including:
   (1) Hiking or caving long distances without developing blisters, tendonitis, or bone bruises;
   (2) Climbing steep inclines, and traversing areas of talus or breakdown, whether aboveground or underground;
   (3) Wading across or along streams;
   (4) Traversing crevices and canyons using techniques including bridging and chimneying; and
   (5) Traversing small areas efficiently, including side crawls, hands-and-knees crawls, belly crawls, and moving through tight areas.

5. Land Navigation and Orienteering
   a. Identify and define the following terms or concepts:
      (1) Latitude and longitude;
      (2) Degrees, minutes and seconds;
      (3) True north and magnetic north;
      (4) Declination; and
(5) Datum
b. Demonstrate the ability to read and interpret a 7.5 minute topographic map border information, colors and symbols, including the following information:
   (1) Grades of highways, roads, trails and bridges;
   (2) Power lines and other landmark lines;
   (3) Buildings, schools, churches and cemeteries;
   (4) Storage tanks, wells, mines, caves, picnic areas and campsites;
   (5) Benchmarks (control stations) and spot elevations;
   (6) Boundaries and fence lines;
   (7) Contour lines, depressions, cuts and fills;
   (8) Perennial and intermittent streams, springs, falls and marshes;
   (9) Valleys, ridges, peaks and sags (saddles, cols);
   (10) Elevations and general land contours; and
   (11) Photo revisions.
c. Describe the various parts of the compass and demonstrate the ability to use it to plot a course on a map, including northing and declination correction.
d. Define the following plotting methods or grid systems and demonstrate the ability to use them to determine the coordinates for a given point.
   (1) Latitude - Longitude;
   (2) USNG (United States National Grid);
   (3) UTM (Universal Transverse Mercator);
   (4) ASRC Grid; and
   (5) Using a ruler and a topographic map.
e. Demonstrate the ability to perform the following navigational functions:
   (1) Obtain and follow a simple compass bearing;
   (2) Determine a reciprocal;
   (3) Move around obstacles;
   (4) Find a position by triangulation and by resection; and
   (5) Determine position by terrain feature identification.
f. Describe the significance and use of these orienteering concepts:
   (1) Catching features;
   (2) Collecting features;
   (3) Attack points;
   (4) Aiming off; and
   (5) Coarse and fine orienteering.
g. Demonstrate basic knowledge and use of a GPS:
   (1) Set correct Datum;
   (2) Determine coordinates for current location;
   (3) Mark a way point; and
   (4) Navigate to a location given only the coordinates.
h. Demonstrate the ability to measure distance by pacing.
i. Demonstrate the ability to navigate at night.
j. Demonstrate proficiency in photocopying grid overlays onto maps.
k. Given a cave map using standard National Speleological Society symbols, demonstrate the ability to:
   (1) Estimate distance;
   (2) Estimate caving travel time between two points; and
   (3) Estimate litter evacuation time between two points.

6. Search Skills
   a. Identify the primary goal of all SAR activity.
   b. Identify and define four key points of search theory.
   c. Define the following search tactics:
      (1) Attraction;
      (2) Containment;
      (3) Survey search;
      (4) Hasty search;
      (5) Sweep search (open grid search);
      (6) Line search (closed grid search); and
      (7) Route search.
   d. List two standard procedures each for working with airscent dogs, tracking/trailing dogs, sign cutters, and mantrackers.
   e. Demonstrate the following abilities in the field:
      (1) Clue awareness strategies;
      (2) Securing and documenting clues;
      (2) Functioning as a member of a grid team, sweep team, and hasty team, and understand his/her role and duties in each type of search pattern;
      (3) Accompany a dog handler on a simple search task;
   g) Explain the use and operation of direction-finding instruments for locating downed aircraft.

7. Aircraft Crash Site Procedures and Disciplines
   a. Describe three hazards commonly associated with an aircraft crash site; list additional hazards that may be present if the crash involves a military aircraft.
   b. Define the proper approach to an aircraft crash site, including safe and unsafe directions to approach, and why they are safe or unsafe
   c. List three reasons why accurate documentation of events at an incident site is important.
   d. Describe three methods to use to secure a site adequately.
   e. Explain the importance of clue preservation at both an aircraft crash site and a possible crime scene.

8. Ropes and Technical Hardware
   a. Define the following terms used to describe ropes used in wilderness rescue:
      (1) Kernmantel construction;
      (2) Static rope;
      (3) Dynamic rope; and
      (4) Tubular webbing.
   b. Describe the use and care of the carabiner, the Figure-8 descender and the brake-bar rack descender.
   c. Demonstrate the ability to tie correctly these knots, properly dressed and backed up:
(1) Figure-8 loop;
(2) Figure-8 bend;
(3) Square knot;
(4) Water knot (overhand bend);
(5) Prusik knot both double and triple-wrap;
(6) Double fisherman's knot or barrel bend;
(7) A redundant seat harness;
(8) Bowline knot;
(9) Girth hitch;
(10) Simple overhand; and
(11) Figure 8 on a bight.

d. Demonstrate these rope handling techniques:
   (1) Uncoiling and stacking a rope; and
   (2) Inspecting a rope.

9. Litter Handling Techniques
   a. Demonstrate these litter handling techniques with appropriate calls:
      (1) Patient loading;
      (2) Litter lift, lower and carry;
      (3) Litter bearer rotation;
      (4) Litter laddering, including toe-nailing;
      (5) Turtling and snaking and paving;
      (6) Lap pass; and
      (7) ASRC standard calls:
         • Ready
         • On Belay
         • Belay On
         • Off Belay
         • Belay Off
         • Down Slow
         • Down Fast
         • Up Slow
         • Up Fast
         • Stop
         • Rock
         • Falling

   b. Demonstrate the ability to act as litter captain in a non-technical evacuation, including the proper
      use of toenailing, laddering, and rotation of litter bearers.

   c. Demonstrate the ability to be a litter team member on a semi-technical evacuation and describe the
      personal equipment required for the rescuer's safety.

   d. Demonstrate the ability to serve as Haul Team Member, Haul Team Leader, Lower Team Leader,
10. Belays
   a. Demonstrate proper belay techniques including:
      (1) Anchoring, including tensionless wrap and wrap-3 pull-2, including selecting appropriate locations;
      (2) Belayer tie-in;
      (3) Stance;
      (4) Aim;
      (5) Uphill and downhill travel;
      (6) ASRC standard calls;
      (7) Tree-wrap and mechanical brakes; and
      (8) Tandem-Prusik Belay.

11. Field Team Organization
   a. Define "field team."
   b. Describe at least five types of search team.
   c. Describe at least four types of rescue team.
   d. Define the functions of the following field team positions:
      (1) Field Team Leader;
      (2) Medical specialist;
      (3) Rescue Specialist; and
      (4) Radio Operator.

12. Helicopter and Airplane Operations
   a. Describe the hazards to ground personnel working around a helicopter.
   b. Describe standard protocols for helicopter operations.
   c. Explain proper procedures for hoist operations.
   d. Describe the considerations for selecting and preparing an LZ.

13. Field Communications
   a. Describe the use and dangers of these signaling devices:
      (1) Aerial flares;
      (2) Smoke;
      (3) Signal mirrors;
      (4) Fires;
      (5) Panels and paulins;
      (6) Hand and body signals; and
      (7) Field telephones used during cave search and rescue.
   b. Define problems associated with the following aspect of field use of portable radios and possible solutions:
      (1) Batteries;
      (2) Cold temperatures;
      (3) Speakers/microphones
   c. Briefly describe basic radio procedures including courtesy, security, brevity and the use of the phonetic alphabet and 10 codes.
   d. Demonstrate use of all group-owned base and hand-held radios and field phones, to communicate
effectively, including:

1. Adjusting of channel, volume, squelch and PL (CTCSS) controls;
2. Operating the radios in compliance with FCC regulations and the ASRC radio SOP;
3. Identify indications of a low battery and demonstrate the technique for changing radio batteries;
4. Demonstrate two techniques for improving marginal communications encountered while using VHF-FM hand-held radios, and
5. Demonstrate techniques for diagnosing and fixing common problems with wired field telephones.

- Demonstrate the ability to use runners with written messages as a communications means for cave search rescue, following best practices.
- Define the ASRC status codes.
- Demonstrate effective ways of using non-radio communications with audible and visual signals such as: whistle or loud noise maker; signal mirror, fire & smoke and lights.

14. Wilderness Medicine. Hold a current American Red Cross Standard First Aid card or equivalent, or higher certification. Hold a current AHA CPR for Health Care Provider certification, or equivalent.

E. Test Methods

1. Written Test
   a. The ASRC standard FTM test consists of questions representative of the material presented in the Field Team Member standard.
   b. The passing score is 80 percent.

2. Practical Tests
   a. The candidate must successfully demonstrate in practical tests the skills in the Knowledge and Performance section which require the demonstration of the knowledge or ability.
   b. Testing can be done in one testing session or spread out over multiple testing sessions.
   c. Each test station has specific requirements and well defined criteria for pass/fail.

F. Certification

1. Upon successfully completing the completing certification criteria, specified in the Qualifications, Equipment, Knowledge and Performance Expectations and Test sections, the Group Training Officer will grant the FTM certification on behalf of the ASRC. The certification becomes valid when the ASRC Board of Directors is informed of the new certification via the submission of an updated roster.

2. The Group Training Officer may provide a certificate to the FTM member. This certificate will be in the official ASRC FTM Certification Format, as defined by the ASRC Conference Training Officer, and which contains at a minimum:
   a. The full name of the Appalachian Search and Rescue Conference;
   b. The ASRC logo;
   c. The name of the member granted the certification;
   d. The name of the certification granted;
   e. The date issued;
   f. The date of expiration/recertification; and
   g. The signature of the Group Training Officer.
Field Team Leader

ASRC Technician, MRA/AMRG Rescue/Technician, Cave Technician

Cave Extensions optional for all AMRG FTLs

Field Team Leader standards define the minimum requirements necessary to lead an organized search team for a missing person search, the ground portion of missing aircraft search, a cave search and non-technical and semi-technical rescues both above-ground and in caves, as well as assisting with technical cave rescues.

A. Qualifications

To become a Field Team Leader (FTL), the applicant must:

1. Be certified as a Field Team Member;
2. Have participated in two searches or search simulations as an FTM;
3. Be proposed for FTL membership by the Group Training Officer at a group business meeting and receive a simple majority of the vote;
4. Successfully pass the standard ASRC FTL written test and the standard ASRC FTL skills practical test;
5. Be at least 18 years old; and
6. Have successfully completed the following FEMA Courses:
   a. IS-800.B, National Response Framework (NRF), An Introduction or an approved equivalents.

B. Recertification

Team Leaders must meet the following recertification requirements every three calendar years following their date of initial certification:

1. Document participation for a minimum of 6 SAR missions that are ground SAR incidents for either missing persons or missing aircraft or cave search and rescue. Simulations may be counted toward recertification requirements. At least one of these must be a cave search and rescue operation or simulation.
2. Hold a current American National Red Cross Standard First Aid card or approved equivalent, or higher certification.
3. Hold a current AHA CPR for Health Care Provider certification, or approved equivalent.
4. Document continuing competency across the entire range of ASRC training standards for FTL. Based on the member’s documentation and any other means such as, but not limited to, testing, the GTO must validate and certify that the member has successfully demonstrated proficiency for each of the following training areas listed in the ASRC training standards under or “Knowledge and Performance Expectations” (FTL).
   a. SAR Operations
   b. Search Tactics
   c. Search Management
   d. Rescue Operations
   e. Equipment
   f. Mission Performance
   g. Ropes and Technical Hardware

1. Each GTO has flexibility to determine how best to accomplish and measure compliance with the competency requirements. The time spent and method chosen will depend on many factors – subject, complexity, skill level of students, experience of instructor, availability of resources, etc. Ultimately, the method to achieve the
standards and the length of time devoted to training really does not matter.

2. The review cycle period shall begin the first January of the year following the initial certification.

C. Equipment Requirements for Certification

To become an ASRC FTL, the application must demonstrate possession of the following personal equipment.

1. Appropriate clothes and footgear for both fair and foul weather including wet caving, including lug sole boots;
2. Water container of one- to two- liter capacity;
3. Day pack (knapsack will be sufficient) and cavepack;
4. Five large, heavy-duty plastic trash bags;
5. Food for 48 hours;
6. Headlamp (or flashlight) and second light source; cave-resistant headlamp and two independent backup cave-resistant light sources, one of which backups is helmet-mountable for hands-free caving required for cave rescue;
7. Lighter, matches and candle, or equivalent WATERPROOF fire source;
8. Knife;
9. Compass;
10. Personal First Aid Kit;
11. WATERPROOF pen/pencil and paper;
12. Whistle;
13. Two pairs plastic or vinyl examination gloves;
14. Eye protection (or glasses);
15. High Visibility vest;
16. Work Gloves, leather palm or equivalent;
17. Two (six) locking carabiners, rated to a minimum 18 kN axial strength (25 kN axial strength, separate from the ascending/descending system);
18. Two Prusik loops, 8 or 9mm rescue cord, from cord not less than 53” long nor more than 65” long (pre-tied lengths).
19. A personal rappel system, including an safe and effective rappel device and sewn seat harness. (acceptable are: rescue eight with ears, rescue rack, micro rack with hyper bar – total 4 bars minimum).
20. A safe and efficient personal ascending system with an extra Prusik or ascender attached to the seat via an adjustable tether (lanyard, Quick Attachment Safety). Ascending system (Purcell Prusiks or mechanical ascenders. Must have an additional Prusik available for knot passing. All ascending systems must have two attachment points above the center of gravity. Systems using a grigri, belay plate, ATC, etc are not acceptable as the primary ascending system.

D. Knowledge and Performance Expectations

Field Team Leaders are expected to meet all of the requirements of the Knowledge and Performance Expectations of the ASRC FTM Standards. The items listed below are additional requirements.

1. SAR Operations
   a. Define the role of the field team for these types of missions:
      (1) Lost person search including cave search;
      (2) Downed aircraft search;
      (3) Rescue including cave rescue; and
b. List the various types of resources in each of the following categories that may be used in a typical SAR event:
   (1) Ground search;
   (2) Air search;
   (3) Logistics;
   (4) Communications; and
   (5) Command.

2. Search Tactics
   a. List and explain in detail five responsibilities of the Field Team Leader when carrying out a field task.
   b. Explain the execution of the following search tactics using a standard sized, properly equipped field team.
      (1) Containment;
      (2) Attraction;
      (3) Survey search;
      (4) Hasty search;
      (5) Sweep search (open grid search);
      (6) Line search (closed grid search);
      (7) Passive and active search methods;
      (8) Clue finders and subject finders;
      (9) Binary search and cutting for sign; and
      (10) Interviewing and investigation.
   c. Describe in detail the actions that must be completed once the field team returns to base camp from a field task.

3. Search Management
   a. Outline standard search strategy for:
      (1) Downed aircraft;
      (2) Lost person, wilderness (including caves);
      (3) Lost person, rural; and
      (4) Lost person, urban.

4. Rescue Operations
   a. Describe how to formulate a rescue plan.
   b. List and describe four major factors a team leader must consider once a subject is located.
   c. Describe the manpower and equipment requirements and the team organizational structure necessary to accomplish an advanced semi-technical rescue operation.

5. Equipment
   a. Describe basic team equipment, other than required personal gear, for a wilderness SAR team, including any special equipment required for cave search and rescue.
   b. Define an equipment inspection process for individual field team members before beginning a field task.

6. Mission Performance
   a. Demonstrate the ability to travel cross country on foot, in any weather conditions, aboveground or in a cave, navigating by map and compass or cave map, and to establish an emergency bivouac, all
without compromising the assigned task.

b. Demonstrate the ability to organize and execute the six tactics listed below:
   (1) Containment;
   (2) Attraction;
   (3) Survey search;
   (4) Hasty search;
   (5) Sweep search (open grid search);
   (6) Line search (closed grid search).

c. Demonstrate the ability to secure a scene properly, extricate and treat a patient, and evacuate a patient using the methods most appropriate for a given situation.

d. Briefly describe pertinent local weather patterns, including the signs of arriving cyclonic winter storms, cold fronts, warm fronts, and local storms.

e. Be able to bivouac on a winter night using appropriate field gear.

f. Travel competently in a middle-Appalachian wilderness area (including limestone caves) during any time of year, including:
   (1) Stream crossing evaluation; and
   (2) Boulder-field and steep trail climbing.

g. Given a 7.5-minute series topographic map with an ASRC and USNG, or UTM grid overprint, and the original 7.5-minute quadrangle map, identify points via:
   (1) Latitude and longitude;
   (2) The ASRC grid system;
   (3) The UTM (Universal Transverse Mercator System) and USNG (United States National Grid); and
   (4) The azimuth and distance off a VOR.

h. Given only a 7.5-minute topographic quadrangle or an orienteering map with an attack point and a target plotted on it, and a standard orienteering compass, reliably and accurately:
   (1) Calculate the true bearing from the attack point to the target;
   (2) Calculate and set on the compass the magnetic bearing to the target; and
   (3) Follow the bearing accurately, including triangulating and boxing around obstacles.

i. Correctly locate and position a point on a topographic map given:
   (1) The bearings to landmarks indicated on the map (resection); or
   (2) The bearing to one landmark located on the map, and the information that the position is on a specified linear feature (modified resection).

j. Given bearings from two locations to a target, correctly locate it on a topographic map (triangulation).

k. Demonstrate the ability to lead a field team competently on:
   (1) Containment, attraction, survey, hasty, sweep and grid search tasks;
   (2) Cutting for sign;
   (3) Simple tracking;
   (4) Interrogation and visual search tasks;
   (5) Non-technical and semi-technical evacuation; and
   (6) Direction finding.

l. Demonstrate the use of the following basic man-tracking skills and techniques:
   (1) Selecting and using a tracking stick;
(2) Identifying the effects of sun direction and intensity on tracking;
(3) Identifying and measuring shoe type and size; and
(4) Determine stride length, width, and direction of travel.

m. Demonstrate the ability to properly brief a field team before a task, including:
   (1) Giving appropriate information on:
   (2) Subject information and history, subject's equipment and medical history; (b) Weather;
   (3) Terrain;
   (4) The search task, its objectives, and how to perform it;
   (5) Time available for the task and the limitations it may impose upon the task; and
   (6) Team equipment and personal gear needed;
   (7) Obtaining information from the team members, such as team member medical problems, and
       other relevant input; and
   (8) Adequately evaluating team members' abilities to do the task.

n. Demonstrate the ability to debrief properly a field team after a task, including:
   (1) Instructing the team to follow proper procedure now the team has returned to base; and
   (2) Acquiring team member input (POD, clues, hazards, and other pertinent information).

7. Ropes and Technical Hardware
   a. Demonstrate the ability to tie correctly the knots below (in addition to those knots listed in the FTM
      standards):
      (1) Butterfly;
      (2) Bowline;
      (3) ASRC seat harness.
      (4) Load-releasing hitch;
      (5) Cross-chest harness;
      (6) Bowline with Yosemite backup; and
      (7) Clove Hitch (end and mid rope).
   b. Assemble and use a single line rappel system that includes a belay; demonstrate stopping and
      controlling a rappeller with a bottom belay.
   c. These skills may be accomplished in separate sessions; safely and efficiently, with both a Rescue 8
      descender and with a rappel rack (standard or micro), and both Prusiks and a mechanical
      ascending system, and a static line at least 20 m (66 feet):¹
      (1) rappel partway down, then safely lock off and tie off, then change back to rappel and rappel
          to the bottom of the drop;
      (2) while on rappel, change to ascend and ascend 3 m (10 feet) and then descend on ascenders 3
          m (10 feet); and
      (3) rappel past a knot, and then ascend past the knot, in less than 8 minutes.
   d. Demonstrate the ability to efficiently and safely climb and then downclimb a 30-foot (10 m) free-
      hanging cable ladder.
   e. Demonstrate the ability to direct a six person litter team safely in rigging a Z-haul system (3:1

¹ The AMRG MRA standards specify 50’, but the FEMA Cave SAR Typing specifies 66’, so chose the longer of the two. Switching to
ascend 3m and then descend on ascenders 3m comes from the FEMA Cave SAR Typing, the knot passes come from the AMRG MRA
standards but are appropriate for cave rescue as well.
system), a 4:1 hauling system, a "brute force" hauling system, and, using the systems, to move a litter a minimum of 100 feet up a 45 degree slope. Properly rig a 2:1 haul system in less than 10 minutes. Properly rig a 3:1 haul system in less than 15 minutes (one assistant can be used to tie wrap 3, pull 2 anchors only).

f. Demonstrate the ability to rig to an anchor using the following methods:
   (1) Tree-wrap and tie-off; and
   (2) Using webbing sling loops.

g. Demonstrate the ability to cast, pad and rig static lines.

h. Demonstrate the ability to belay competently, including:
   (1) Proper anchoring, stance, tie-in and aim;
   (2) Correct use of calls and fall catching; and
   (3) Rigging and using a Tandem Prusik belay that includes a load-releasing hitch, including operating the load-releasing hitch.

i. Demonstrate competence in braking litters with tree wrap belays and mechanical devices, including rigging and using a rappel rack for a vertical lower.

j. Serve competently in all positions on a semi-technical rescue, including:
   (1) Serving as rope team leader with tree-wrap brakes, Figure-8, and brake bar rack; and
   (2) Selecting suitable anchor points.

k. Demonstrate the ability safely to load and tie a patient into a litter, and rig it for semi-technical evacuations or technical evacuations, within 15 minutes.

l. Safely and efficiently set up a high-angle redirect for a vertical rescue.

m. Demonstrate competence in route selection for a semi-technical evacuation.

n. Demonstrate the knowledge of and ability to care properly for ropes and technical rescue equipment.

E. Test Methods

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