

**COMMONWEALTH OF VIRGINIA**  
**DEPARTMENT OF EMERGENCY MANAGEMENT**  
**SEARCH AND RESCUE PROGRAM'S**  
**STANDARDS FOR**  
**WILDERNESS RESCUE TECHNICIAN (RT)**

**I. PURPOSE**

- A. The Wilderness Rescue Technician Standard is developed to define the minimum requirements necessary to perform the following advanced semi-technical and technical functions in wilderness and primitive areas of the Commonwealth of Virginia:
1. As the Rescue On-scene Coordinator, (ROC), advise the Incident Commander on all technical aspects of rescue and evacuation of a subject from a vertical or high angle situation in a wilderness or primitive area.
  2. Evaluate a technical rescue situation and document a rescue plan for the evacuation of a subject from a vertical or high angle situation, using the most appropriate techniques and systems, with consideration given to safety concerns and alternative evacuation routes and methods.
  3. Lead an evacuation team with appropriate personal and team equipment in stabilization and evacuation of a subject from a vertical or high angle situation.
- B. The Wilderness Rescue Technician should be capable of performing these functions any time of the year, day or night, and in all weather experienced in the Commonwealth. To accomplish this, the RT should be able to:
1. Use standard extrication and patient packaging techniques.
  2. Evaluate and place anchor systems.
  3. Rig or supervise the rigging of necessary rope systems.
  4. Recognize safety problems and enforce safety standards.
  5. Supervise all roped travel and litter movement.

## **II. RECOGNITION CRITERIA:**

### **A. Age:**

The minimum age for an RT is 18.

### **B. Affiliation and Experience**

Applicants for recognition as Wilderness Rescue Technician should hold active membership in a professional SAR group or an established emergency services organization such as a law enforcement agency, rescue squad, or fire department.

### **C. Applicant must hold a current FTL certification or an equivalent standard recognized by the Virginia Department of Emergency Management (VDEM).**

### **D. Applicant must hold valid Basic First Aid qualification or a higher rating.**

### **E. Applicants must possess the training and personal equipment necessary to reach a subject in a high angle or vertical situation and assist him or her to safety.**

## **III. KNOWLEDGE AND PERFORMANCE EXPECTATIONS**

The Wilderness Rescue Technician (RT) will demonstrate an understanding of the items listed under the subjects below. Most items require the performance of strenuous manual skills in field conditions that may include slopes of 30° or more and vertical faces 33 feet or more in height. Training requirements for the RT are in addition to those for Field Team Leader

### **A. TRAINING**

1. RT's normally engage in training and practice of technical search and rescue skills over a period of two or more years before seeking recognition, usually through SAR mission technical task experience and/or rescue simulations. Any vertical and high-angle rope rescue training program with recognized state or national training standards may provide the applicant with basic RT skills, including fire rescue, cave rescue, and related technical training venues.
2. Individuals who possess the necessary knowledge, skills, and abilities by virtue of past training or experience may challenge the written and practical skills testing process required of the RT. Upon successful completion of the written and practical skills testing, the individual will be certified as a Wilderness Rescue Technician.
3. A Test Method for Recognition of Wilderness Rescue Technicians and Skills Check-sheets are available to assist SAR organizations and interested rescuers in developing their own training programs for advanced semi-technical and vertical skills.
4. Applicants for RT recognition must maintain training and mission logs documenting training and mission experience, including technical task assignments on:

- a. Two State search missions
- b. One search and two Full-scale State simulated searches
- c. Four full-scale State simulated searches

## B. DUTIES

1. A Wilderness Rescue Technician must be able to satisfactorily explain his or her duties and responsibilities, which include:
  - a. As the Rescue On-scene Coordinator, advise the Incident Commander on all technical aspects of rescue
  - b. Size-up hazards at a vertical or high angle rescue site, and develop and document a suitable rescue plan
  - c. Lead an evacuation team with appropriate personal and team equipment in the evacuation of a subject from a wilderness or primitive vertical or high angle situation
  - d. Rig or direct team members in the rigging necessary rope systems for vertical or high angle evacuation, including rigging of litters for hoisting or lowering the subject
  - e. Supervise all roped travel and technical litter movement
  - f. Enforce safety standards.

## C. WILDERNESS TRAVEL

1. Explain the prerequisites for and proper safe use of lead climbing techniques required for anchor placement in rigging and for personal movement to guide a litter
2. Demonstrate the ability to lead 5.0+ (Sierra Scale) rock climbs

## D. WILDERNESS ROPEWORK

1. Describe rescue rope materials and construction, and some rescue applications and advantages and disadvantages for each.
  - a. Differentiate the manufacturer's advertised breaking strength and the safe working strength of 11 mm (7/16") Nylon rescue rope
  - b. Discuss and describe construction and elongation characteristics and applications for "static" or "low-stretch" rescue rope
  - c. Discuss and describe construction and elongation characteristics and applications for "dynamic" or "controlled stretch" climbing ropes
2. Describe and demonstrate the proper care of Nylon rope and web gear, including:

- a. Care of rope and webbing while in use
  - b. Inspection of rope and web gear for damage
  - c. Washing
  - c. Drying
  - d. Storage
  - e. Criteria for retirement
3. Demonstrate the ability to coil, tie off, and properly package rope for storage and for transport
4. Describe the effects of chemical and other agents upon Nylon rope and web gear:
  - a. Chemicals (petroleum, acids, etc.)
  - b. Heat, including weld abrasion
  - c. Ultraviolet degradation
  - d. Mechanical damage, (abrasion, trampling, etc.)
  - e. Aging
5. Demonstrate the ability to correctly tie, contour, and back up the following knots using 11 mm (7/16") rescue rope, (12 mm or 1/2" rescue rope if required by home agency). Describe each knot in terms of strength, security, proneness to jamming in common rescue situations, and appropriate and inappropriate uses:
  - a. Bowline
  - b. Bowline-on-a-bight
  - c. Bowline-on-a-coil
  - d. Trucker's hitch
  - e. One-way knot
  - f. Load releasing hitch
  - g. Overhand knot
  - h. Overhand bend (ring bend, water knot)
  - i. Figure-8 knot
  - j. Figure-8 loop
  - k. Figure-8 bend (figure-8 follow-through)
  - l. Square knot
  - m. Prusik
  - n. Double Fisherman's knot (barrel bend)
  - o. Butterfly
  - p. Redundant seat harness from 1" flat or tubular Nylon webbing
5. Demonstrate the ability to rig and use multiple-step pull down rappels
6. Demonstrate the ability to assemble and ascend properly using the following devices. Describe each in terms of strength, security, holding strength, special hazards, and appropriate uses:
  - a. Open-sided mechanical ascenders, (Petzel, Jumar, CMI)
  - b. Closed-shell mechanical ascenders, (Gibbs)
  - c. Classic 2-turn Prusik knots
7. Describe the proper selection, placement, and use of pulleys, including discussion of advantages and disadvantages of various types and safety issues:

- a. Size and sheave diameter in relation to the rope
  - b. Configuration, (double sheave, Prusik-minding, etc.)
  - c. Bearing- vs. bushing-type construction
  - d. Use of carabiners in place of pulleys
8. Demonstrate the ability to rig and belay the body weight of a single climber competently and safely with the following techniques\devices on steep or high angle slopes in wilderness or primitive areas:
- a. Sitting hip belay
  - b. Standing hip belay
  - c. Tree-wrap belay
  - d. Münster hitch belay
  - e. Belay plate or "thimble"
  - f. Bottom belay (of a rappeller)
  - g. Figure eight\rescue eight using the eye as a belay plate
10. Demonstrate the use of standard belay calls
11. Demonstrate the ability to select, place, and rig anchors for individual rappel use and for patient evacuations:
- a. Demonstrate and discuss evaluation and use of tree and rock formations
  - b. Demonstrate and discuss the placement and evaluation of mechanical anchors
  - c. Demonstrate high strength (tree-wrap, round-turn, tensionless) anchor rigging
  - d. Demonstrate "load-sharing" anchor systems with two or more fixed-length "legs" from anchor points to a stationary focal point.
  - e. Demonstrate "load distributing" ("self adjusting" ) anchor systems with two or more fixed length "legs" from anchor points to a moving focal point.
  - f. Discuss the advantages and disadvantages of "rigging high"
  - g. Demonstrate "aiming" the anchor system and main line, and evaluating the fall line.
  - h. Demonstrate rigging using questionable multiple anchor points and Prusik loops and tied loops.
12. Demonstrate the ability to rig static lines in primitive and wilderness environments, including:
- a. Casting lines through brush or past obstructions
  - b. De-fouling lines
  - c. Assessing abrasion hazards and installing padding and chafing gear
  - d. Rigging offset lines with directional anchors
  - e. Rigging horizontal traverse lines (high lines)
  - f. Rigging diagonal traverse lines

13. Demonstrate the ability to use one's personal mechanical rappel device and personal mechanical ascending system to safely:
  - a. Rappel and ascend past overhangs
  - b. Tie off climbing\rappe system, invert self, recover, and then continue, both on rappel and while ascending
  - c. Rappel and ascend past knots
  - d. Change from rappel to ascent
  - e. Change from ascent to rappel
  - f. Rappel and ascend diagonal traverse lines
  - g. Rappel and ascend through a re-belay point (slack traverse)
  
14. Describe several examples of abrasion protection methods, and discuss the advantages and disadvantages of each
  
15. Describe the effects of "theta" angle on the safety of rope and anchor systems. Explain the dangers of failure to recognize hidden "theta" angles in rigging systems, and the dangers that develop as "theta" angles exceed 90°

#### E. LITTER MANAGEMENT

1. Demonstrate the ability to properly rig closed-side litters for patient movement in advanced semi-technical and vertical conditions:
  - a. For vertical evacuations with the litter horizontal
  - b. For vertical evacuations with the litter vertical
  - c. Horizontal evacuations through crevices, dense brush, using drags, passing methods
  - d. Evacuation up\down or across low-angle (10°to 20°) slopes
  - e. Explain or demonstrate additional precautions for patient movement in cold and wet weather
  - f. Demonstrate packaging using 1" Nylon webbing tie-ins
  - g. Discuss and demonstrate the use of pre-tied Yosemite spiders and spiders tied from 1" Nylon webbing loops
  - h. Patient packaging for helicopter hoist operations
  
2. Demonstrate the ability to use the following haul systems with appropriate haul team placement, progress capture devices, and belay systems:
  - a. Simple Z-rig (3:1 haul system)
  - b. Piggyback Z-rig
  - c. Simple 4:1 haul system
  - d. Piggyback 4:1 haul
  - e. "Georgia haul," brute force method

3. Rig a litter and properly secure a patient for extended transport in advanced semi-technical environments:
  - a. Evacuation up/down and across steep (20° to 30°) slopes
  - b. Vertical lower evacuation with one rope and top brake
  - c. Vertical lower evacuation with two ropes and top brake
  - d. Vertical haul evacuation with one rope, litter horizontal
  - e. Vertical haul evacuation with two ropes, litter vertical
4. Demonstrate the use of standard rope and haul system commands.
5. As team member and team leader in various stations, demonstrate the ability to rig, tension, and safely use horizontal and diagonal highlines for movement of personnel, equipment, patients and litter attendants:
  - a. Single highline
  - b. Double highline
  - c. Self-equalizing double highline
  - d. Use of redundant single pulleys for rigging and tensioning
  - e. Use of knot-passing pulleys for rigging and tensioning
6. Demonstrate the ability to use and pass knots through the following braking systems, using load-releasing hitches and other appropriate rigging equipment:
  - a. Tree wrap
  - b. Figure eight descender with "ears"
  - c. Long rappel rack
7. Demonstrate the rescue of a cooperative, conscious person from the following situations, and safely lower them:
  - a. With both rescuer and subject the same line
  - b. With the subject stuck on a belay line
  - c. With the subject stuck on rappel or climb and the rescuer on a second line
8. Demonstrate the rescue of an unconscious person from the following situations, and safely lower them:
  - a. With both rescuer and subject the same line
  - b. With the subject stuck on a belay line
  - c. With the subject stuck on rappel or climb and the rescuer on a second line
9. Demonstrate the ability to rig and use a Tragsitz-type sling harness to take the weight of a subject onto the rescuer's person and lower them on a mixed high angle and vertical pitch, using 2" Nylon webbing and assorted slings and carabiners to secure the subject
10. Demonstrate the ability to correct the following problems on rope:
  - a. Recover from inversion while on rope (heel hang, etc)
  - b. Correct a fouled ascender
  - c. Replace a failed ascender

- d. Climb "blind," simulating light failure at night
- e. Rappel "blind," simulating light failure at night
- f. Pass a knot on rappel
- g. Pass a knot while climbing
- h. Down-climb with personal mechanical ascending system
- i. Change over from climbing to rappel.
- j. Change over from rappelling to climbing
- k. Change from one rope to another while rappelling
- l. Change from one rope to another while climbing

#### **IV. TEST METHODS**

The RT must document his or her training and experience, complete written testing, and competently perform practical demonstrations of the semi-technical and vertical or high angle skills outlined in the Standards for Wilderness Rescue Technician in a wilderness or primitive advanced environment.

##### **A. Witten Testing**

- 1. A written test consisting of 100 multiple choice questions reflects the rescue tasks and rescue equipment referenced in this Standard.
- 2. The written test is administered at any time, prior to or following technical and advanced semi-technical rescue training. A variety of training programs are available from fire/rescue instructors and instructors with backgrounds in the MRA, NASAR, and NCRC (cave rescue).
- 3. A score of 80 or higher on the written test is considered passing.

##### **B. Practical Testing**

- 1. The practical tests consist of skills stations, with tasks outlined in Skills check-off sheets. Rescuers should participate as team leader and team member when demonstrating multiphase assignments such as constructing and operating a haul system or high line.
- 2. Each check-off sheet indicates passing or failing criteria.
- 3. Applicants for recognition as RT who fail to pass a skill check may re-challenge that skill once on that same testing day.

##### **C. Applicants for Recognition as RT may re-train and apply to repeat the individual skills check(s) that they did not complete.**

## **V. RECOGNITION PROCEDURES**

A. To be recognized as a Wilderness Rescue Technician, the applicant must:

1. Document his or her on-going experience in semi-technical and technical high-angle or vertical rescue missions or direct participation in rescue missions or rescue simulations in a personal training log.
2. Pass the written test of RT skills and information.
3. Successfully complete each of the skills indicated in this Standard.

B. Equivalent Training and/or Experience:

Individuals who possess the necessary knowledge, skills, and abilities by virtue of past training or experience may be permitted to challenge the written and practical skills testing process required of the RT. Upon successful completion of the written and practical skills testing, the individual will be certified as a Wilderness Rescue Technician.

C. Recognition

Upon successful completion of written and practical testing, a certificate will be issued to the new Wilderness Rescue Technician by VDEM. This certificate signifies only that the person holding the certificate has met the established standards of knowledge and performance, and that that person should be able to function in a competent manner at the level indicated on the certificate.

The certificate does not constitute a license to practice the skills taught in vertical and high angle training.

## **VI. RE-CERTIFICATION PROCEDURES**

A. Notification of Expiration of Certification

1. Six (6) months prior to the expiration date a letter will be sent to the RT, noting the expiration date and defining the recertification procedure.
2. A second letter will be sent during the RT's expiration month, month, stating that if recertification is not accomplished within six (6) months of expiration, the RT's certification will be dropped.
3. Six (6) months after expiration, the record reverts to an inactive status.

B. Procedure

1. Certification may be renewed by the RT's successful completion of the written and practical tests and other requirements for certification for Wilderness Rescue Technician that exist at the time of re-certification.
2. Each RT is responsible for making his or her individual arrangements for recertification testing with the DES SAR Coordinator.
3. Certification will be valid for three (3) years from date of issue.