



Virginia Department of Fire Programs  
Technical Rescue Division  
**INTRODUCTION TO TECHNICAL RESCUE**  
NFPA 1006, 2013 edition, Chapter 5 (5.2 – 5.5)  
NFPA 1670, 2009 (Chapters 5.2, 7.2, 8.2, 11.2)  
(Awareness Level)

## **Section 1 - ADMINISTRATIVE GUIDELINES**

### **1.1 Course Description:**

This course provides a foundation to prepare students for a wide variety of possible rescue operations based on objectives from NFPA 1006 *Standard on Technical Rescuer Professional Qualifications*, Chapter 5 and the Awareness Level of NFPA 1670 *Standard on Operations and Training for Technical Search and Rescue Incidents*. This 32 hour course is divided into two modules, with an additional 8 hour module for non-mandatory certification testing. Additionally, Hazardous Materials Awareness Level Training is required prior to certification.

Module 1 is an 8 hour classroom-only program addressing required awareness levels of NFPA 1670, specifically, Rope Rescue Awareness, Confined Space Rescue Awareness, Trench and Excavation Search Rescue Awareness, and Vehicle Search and Rescue Awareness. This course includes an overview in areas of specialized rescue; hazard recognition; atmospheric monitoring; search; rescue incident management and risk assessment; associated phobias; and the technical rescue response system in Virginia. This program should be attended by all members of any organization which respond to technical rescue calls. Students will receive a VDFP Certificate of Attendance. **Module 1 is required prior to attending Module 2. Students must be 18 years of age.**

Module 2 is a 24-hour introductory classroom and practical course addressing the job performance requirements of NFPA 1006. This course will require basic rescue skills in the low and high angle environments to include site operations; establishment of landing zones for helicopter operations; victim management; rope, knots, and anchoring systems. This course is designed for personnel who will actually serve on or in support of a technical rescue incident. Students will receive a VDFP Certificate of Attendance. **Successful completion of Modules 1 and 2 are required prior to Module 3. Students must be 18 years of age and have completed a VDFP approved Hazardous Materials Awareness training program prior to attending.**

Module 3 is an 8-hour written and testing module. This module must be successfully completed in order for a student to seek ProBoard certification in any future VDFP technical rescue course. Students who are not seeking ProBoard certification are not required to complete Module 3 in order to continue their VDFP technical rescue training. Students who do successfully complete testing will receive a Pro-Board registered VDFP Training Certificate.

**Completion of this gateway course is a mandatory pre-requisite for all Virginia Department of Fire Programs Heavy and Technical Rescue courses, regardless if a student is seeking Pro-Board certification or not.**



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### **1.2 Course Information:**

This course is designed to meet or exceed:

*NFPA 1006 Standard on Technical Rescuer Professional Qualifications*, 2013 edition Chapter 5 Job Performance Requirements (Chapter 5.2 to 5.5.14)

*NFPA 1670 Standard on Operations and Training for Technical Search and Rescue Incidents* 2009 edition (Chapter 5.2, 7.2, 8.2, and 11.2)

### **1.3 Logistical Requirements of Host Jurisdiction**

- 1) Classroom facilities
  - a. Suitable size, comfortable and meeting the needs to deliver course lecture.
  - b. Adequate and appropriate restroom facilities (to include training grounds).
  - c. Lighting able to be controlled for projector operation.
  - d. Tables and chairs for 24 students.
  - e. LCD Projector and screen, computer with remote mouse.
  - f. Chalkboard, whiteboard, or easel pad with markers or chalks..
- 2) Training site facilities
  - a. Incline area between 15 and 30 degrees of slope, but no greater than 45 degrees (i.e. ravine, embankment) of at least 50 feet in length. Incline area should be clear of debris and overgrowth (weeds, briars, etc) and have a safe area for students to work at the top of the incline.
  - b. Elevated structure suitable for rope rescue activities to include haul systems, lowering systems, and adequate rigging points. Structure height minimum of 20 feet with safe access to top of the structure.
  - c. Alternate training site with overhead covering for inclement weather.
- 3) Rescue mannequin (preferable) or three 50 ft sections of 1 ¾" or larger fire hose for rescue load.
- 4) Request Rope 1 trailer from VDFP. Trailer must be requested by host jurisdiction for non-funded or reimbursable schools. Funded classes will be provided trailers without an additional request being needed.



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#### **1.4 Required Student Materials/Equipment/Uniforms**

- 1) PPE
  - a. NFPA rated fire helmet or NFPA or ANSI rated technical rescue helmet
  - b. Boots with adequate ankle protection.
  - c. Gloves (structural firefighting gloves **NOT** suitable for this class)
  - d. Eye protection
  - e. Long pants
  - f. No loose fitting clothing which may get tangled in rope hardware.
  - g. Any long hair must be able to be secured in helmet or clothes.
  - h. Each student is required to provide a NFPA rated Class 2/Class 3 rescue harness certified per manufactures recommendations. Each harness will be inspected and approved by the VDFP Instructional Staff prior to use.

#### **1.5 Course Pre-requisites:**

##### **Module 1**

1. Student **MUST** be 18 years of age on the first day of class.
2. Students must be a member in good standing with an organization which responds to technical rescue incidents to apply to attend.

##### **Module 2**

1. Student **MUST** be 18 years of age on the first day of class.
2. Students must be a member in good standing with a recognized fire, EMS, or public safety agency/department to apply to attend.
3. Student shall be psychologically, physically, and medically capable to perform assigned duties and functions at technical search and rescue incidents and to perform training exercises in accordance with NFPA 1500 *Standard on Fire Department Occupational Safety and Health Programs*, Chapter 10 – Medical and Physical Requirements.
4. Completion of VDFP recognized Hazardous Material Operations course.

##### **Module 3**

1. Student **MUST** be 18 years of age on the first day of class.
2. Students must be a member in good standing with a recognized fire, EMS, or public safety agency/department to apply to attend.
3. Student shall be psychologically, physically, and medically capable to perform assigned duties and functions at technical search and rescue incidents and to perform training exercises in accordance with NFPA 1500 *Standard on Fire Department Occupational Safety and Health Programs*, Chapter 10 – Medical and Physical Requirements.
4. Completion of Introduction to Technical Rescue Module 1 and 2.



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**Technical rescue is psychologically and physically demanding work. Students must be capable of lifting heavy loads, working at various elevations and operating in potentially hazardous environments.**

### **1.6 Course Registrations:**

- 1) All students must be pre-registered in VDFP's Fire Service Training Records System (FSTRS) before being allowed to participate in the class.
- 2) No unregistered students (walk-ins) will be allowed for Module 2 classes.
- 3) Class size for Module 1 is limited only by adequate classroom space. Class size for Modules 2 and 3 is limited to 24 students.

### **1.7 Course Curriculum/Outline**

#### **Module 1** Introduction to Technical Rescue, 8-hours of lecture

1. Welcome/Introduction/Paperwork
2. VDFP Technical Rescue Training Progression
3. Introduction to Technical Rescue
4. Regulations and Standards Affecting Technical Rescue
5. Review of NFPA Standards as related to Technical Rescue
  1. NFPA 1670
  2. NFPA 1006
  3. NFPA 1983
  4. NFPA 1500
  5. NFPA 1521
6. Technical Rescue Response Systems
7. NFPA 1670 Core Subject Awareness Deliveries
  1. Chapter 5 – Rope
  2. Chapter 7 - Confined
  3. Chapter 8 - Vehicle
  4. Chapter 9 – Water
  5. Chapter 11 – Trench



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**Module 2** Introduction to Technical Rescue – NFPA 1006, Chapter 5 Job Performance Requirements (JPRs) 4 hours lecture and 12 hours practical skills

**Lectures**

1. 5.2 Site Operations
2. 5.3 Victim Management
3. 5.4 Maintenance
4. 5.5 Rope / Rigging

**Practical Skills**

1. Knots
2. Low angle operations
3. Mechanical advantage systems
4. High angle operations

**Module 3** Written and Skills Testing, 8 hours

**1.8 Reference Material and Supplemental Information**

*Fundamentals of Technical Rescue*, Rhea and Rousseau, Jones and Bartlett, 2009  
*NFPA 1006, Standard on Operations and Training for Technical Search and Rescue Incidents*, 2013  
*NFPA 1670, Standard for Technical Rescuer Professional Qualifications*, 2009

**1.9 Course Completion Requirements for Students:**

Module 1

- 1) Students are required to attend 100% of the classroom lecture.
- 2) Classroom only, no written test.
- 3) Online course

Module 2

- 1) Students are required to attend 100% of classroom and practical sessions.
- 2) Classroom and practical sessions. Students must complete all practical skills.
- 3) No written test.

Module 3 (For students seeking Pro-Board certification)

- 1) No classroom or practical demonstrations, testing only.
- 2) Must pass 50 question written test with score of 70% or greater.
- 3) Must pass all practical skill stations.



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## **Day 1**

### **Instructor briefing prior to start of class (15 min)**

- a. Assign workshop duties
- b. Send instructor(s) to evaluate practical location(s)(after introductions)
- c. Assign instructor(s) to start pre-course trailer inventory

### **1. Lecture (4 Hr)**

- a. Instructor and Program Introductions
- b. Paperwork
- c. NFPA Standards
- d. Course Objectives
- e. 5.2 Site Operations
  - i. Identify resources
  - ii. Manage hazards
  - iii. Manage resources
  - iv. Conduct search
  - v. Conduct ground support operations for helicopter operations
  - vi. Terminate technical rescue operations
- f. 5.3 Victim Management
  - i. Triage
  - ii. Moving patients
  - iii. Transferring patients to EMS
- g. 5.4 Inspection and Maintenance
  - i. Personal protective equipment
  - ii. Rescue equipment
- h. Rope Rescue Situations
  - i. Low angle
  - ii. High angle
- i. 5.5 Ropes / Rigging
  - i. Software
  - ii. Hardware
  - iii. PPE
  - iv. Equipment protection
- j. Knots, Bends, and Hitches



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- k. Single Point Anchors
  - i. Pickets
  - ii. Critical angles
  - iii. Anchor Systems
- l. Edge Protection
- m. Mechanical Advantage Systems
- n. Lowering Systems
- o. Belay Systems

**LUNCH** (1Hr)

**2. Knot Workshop** (1Hr)

**a. Tie Knots, Bends, and Hitches** (5.5.1)

- i. End of line loop
  - 1. Figure 8 on a Bight
  - 2. Double Bight Figure 8
- ii. Midline loop
  - 1. Butterfly knot
- iii. Securing rope around desired objects
  - 1. Half Hitch
  - 2. Clove Hitch
  - 3. Figure 8 Loop
- iv. Joining rope or webbing together
  - 1. Square Bend
  - 2. Figure 8 Bend
  - 3. Water Bend
  - 4. Double Fisherman's Bend
  - 5. Barrel Bend
- v. Gripping Rope
  - 1. Tandem Triple Wrap Prusik (Rigging)
  - 2. Double Wrap Prusik (Personal)
- vi. Other Knots
  - 1. Overhand Knot
  - 2. Stopper 8
  - 3. Truckers Hitch

**3. Skill Station Rotations** (3 Hr)

**a. Construct Simple Mechanical Advantage Systems** (5.5.4) (1 Hr)



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- i. 1:1
  - ii. 2:1
  - iii. 3:1 (Z Drag)
- b. **Construct a Lowering System (5.5.8) (1 Hr)**
- i. Main line
  - ii. Descent Control Devices
    - 1. Figure 8
    - 2. Brake Bar Rack
    - 3. Rigging Rack
- c. **Construct a Belay System (5.5.11) (1Hr)**
- i. Load Releasing Hitches (LRH)
    - 1. Modified Mariner LRH
  - ii. Tandem Triple Wrap Prusik

## Day 2

4. **Knot Workshop Refresher** (1Hr) [Class in 1 group]
5. **Skill Station Rotations** (2 Hrs) [Class divided into 2 groups]
- a. Stokes Basket
    - i. Cross Lashing
    - ii. Main Line Attachment
    - iii. Attendant Attachment
  - b. Picket Systems
    - i. 1:1
    - ii. 1:1:1
    - iii. 2:1
6. **Lunch** (1 Hr)
7. **Skill Station Rotations** (2 Hrs) [Class divided into 2 groups]
- a. **Low Angle Station** (2 Hrs)  
(5.3.2)(5.5.2)(5.5.3)(5.5.4)(5.5.5)(5.5.7)(5.5.8)(5.5.9)(5.5.11)(5.5.12)(5.5.14)
    - i. Anchors
    - ii. Patient Access
      - 1. Single Rescuer Belays



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- a. Tree Wrap
- b. Prusik Self Belays
- iii. Construct and operate a lowering system
- iv. Construct and operate a simple mechanical advantage system
- v. Conduct system safety check

**b. High Angle Station (2 Hrs)**

(5.5.2)(5.5.3)(5.5.4)(5.5.6)(5.5.8)(5.5.10)(5.5.11)(5.5.12)(5.5.13)(5.5.14)

- i. Construct and operate a lowering system
- ii. Construct and operate a simple mechanical advantage system
- iii. Construct and operate a tandem triple wrap Prusik belay
  - a. Belay and arrest a falling load
- iv. Conduct system safety check

**8. Practical Scenario [Time permitting]**

- a. Low angle

**Day 3**

**Figure 8 Rappel Demo(1 large group) (4-6 hrs. depending on class size and site)**

1. Rig training platform to support required number of dynamic rappel lines
2. On ground Instructor demonstrates proper reeving of figure 8 and rappel position, while using proper rope commands
3. Allow students to practice reeving figure eight and rappel position at low or ground level, while using proper rope commands and brake control (Harness hang check)(stress fit, comfort and correctness of donning the harness)

**Figure 8 Rappels**

1. Instructor demonstrates proper bottom belay position and load control
2. Instructor demonstrates self-belay
3. Instructor demonstrates top belay system



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4. Each student completes two rappels with bottom belay (1 were belay takes and controls the load)
5. Each student completes one rappel with self-belay
6. Each student completes one rappel with top belay

**Figure 8 Rappels with lock off**

1. At low level instructor demonstrates 8 lock off and unlock using proper rope commands
2. Each student completes two rappels with lock offs using proper rope commands

**Figure 8 Rappel with self-rescue**

1. At low level instructor demonstrates 8 lock off and self-rescue using proper rope commands
2. Each student completes two rappels with lock off self-rescue using proper rope commands

**Combined Low and High Angle scenario utilizing Figure 8 with belay**

1. Class scenario (Not required, performed if time & site allows)

**Final Trailer Inventory and class paperwork**



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NFPA 1006 Chapter 5.5 Requirements

- 5.5.1 Tie knots, bends, and hitches
  - Section 2 Workshop
  - Section 3 Rotations
  - Section 4 Rotations
- 5.5.2 Construct a single point anchor system
  - Section 3 Rotations
  - Section 4 Rotations
- 5.5.3 Place edge protection
  - Section 3 Rotation
  - Section 4 Rotation
- 5.5.4 Construct a simple rope mechanical advantage system
  - Section 7 practical
- 5.5.5 Direct a team in the operation of a simple rope mechanical advantage system in a low-angle raising operation a minimum distance of 10 feet
  - Section 3 lecture
  - Section 5 workshop and practical
- 5.5.6 Direct a team in the operation of a simple rope mechanical advantage system in a high-angle raising operation a minimum distance of 10 feet
  - Section 3 lecture
  - Section 4 workshop
  - Section 5 practical
- 5.5.7 Function as a litter tender in a low-angle lowering or hauling operation a minimum distance of 10 feet
- 5.5.8 Construct a lowering system
- 5.5.9 Direct a lowering operation in a low-angle environment a minimum distance of 10 feet
- 5.5.10 Direct a lowering operation in a high-angle environment a minimum distance of 10 feet
- 5.5.11 Construct a belay system
- 5.5.12 Operate a belay system during a lowering or raising operation in a high-angle environment
- 5.5.13 Belay a falling load in a high-angle environment
- 5.5.14 Conduct a system safety check