



Virginia Department of Fire Programs
Technical Rescue Division
ROPE RESCUER – LEVEL I
Chapter 6 (6.1 – 6.2.4) NFPA 1006, 2013 edition
ROPE RESCUE OPERATIONS
Chapter 5 (5.3, 5.4.2 (1, 3, 5, 6)) NFPA 1670, 2009 edition

Section 1 - ADMINISTRATIVE GUIDELINES

1.1 Course Description:

This program meets or exceeds the requirements for NFPA 1006 *Standard for Technical Rescuer Professional Qualifications*, Chapter 6, Level I. The student will learn to perform at the Operations Level as specified in NFPA 1670, *Standard on Operations and Training for Technical Search and Rescue Incidents*, Chapter 5.

This 32 hour program includes classroom and practical training in creating multi-point and fixed rope anchor systems, building and operating simple and compound mechanical advantage systems in the high angle environment, ascending and descending a fixed rope, packaging and moving a victim, tending a litter in the high angle environment, rescuing a stranded subject in the high angle environment, operating as a member of a rescue team and directing rescue operations.

1.2 Course Information:

This course meets or exceeds:

NFPA 1006 Standard on Technical Rescuer Professional Qualifications, 2013 edition Chapter 6.1
Rope Rescuer – Level I

NFPA 1670 Standard on Operations and Training for Technical Search and Rescue Incidents 2009 edition; Rope Rescue Operations, Chapter 5.

NFPA 1983 Standard for Life Safety Rope and Equipment for Emergency Services.2006 edition

1006 Standard

		<u>Course Correlation</u>
6.1.1	Construct a multi-point anchor system	Section 3 and 4
6.1.2	Construct a compound rope mechanical advantage system	Section 10, 11, and 12
6.1.3	Construct a fixed rope system	Section 3 and 4
6.1.4	Direct the operation of a compound rope mechanical advantage system in a high-angle environment	Section 11 and 12
6.1.5	Ascend a fixed rope in a high-angle environment	Section 7
6.1.6	Descend a fixed rope in a high-angle environment	Section 8
6.2.1	Complete a task while suspended	Section 12
6.2.2	Move a victim in the high angle environment	Section 12
6.2.3	Function as a litter attendant	Section 12
6.2.4	Direct a team in the removal of a victim	Section 12



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1670 Standard

- 5.3.2(1) Move a victim and rescuer from one location to another
- 5.3.2(2) Access, manage, and package patient in both low and high angle environments

Course Correlation

- Section 11 and 12
- Section 11 and 12

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) Elevated structure suitable for ascending and descending operations with adequate rigging points and safe access to the top of the structure. Rural areas may use natural areas (rock faces, outcrops, elevated bridges, etc) with the lead instructor's approval.
- 3) Suitable structure with interior exposed truss roof for conducting mechanical advantage training. Minimum required area is sixty (60) x forty (40) feet with safe access to trusses, for example, apparatus bay, gymnasium, warehouse.
- 4) Alternative training site with overhead protection for inclement weather.
- 5) Local point of contact with knowledge and authorized access of training sites to be used.
- 6) VDFP Rope 2/3 trailer. 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.

1.4 Required Student Materials/Equipment/Uniforms

- 1) PPE
 - a. NFPA rated fire helmet or technical rescue helmet
 - b. Boots with adequate ankle protection.
 - c. Gloves – tight fitting gloves which allow manual dexterity. (Structural firefighting gloves are NOT suitable for this class.)
 - d. Eye protection
 - e. 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.
 - f. Long pants (no loose fitting clothing while loaded on rope)



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1.5 Course Pre-requisites

- 1) Students **MUST** be 18 years of age.
- 2) Successful completion of Virginia Department of Fire Programs *Introduction to Technical Rescue Module 1 and Module 2* programs.
- 3) Students must be a member in good standing with a recognized fire, EMS, or public safety agency/department to apply to attend.
- 4) Students 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 of NFPA 1500 *Standard on Fire Department Occupational Safety and Health Program*, Chapter 10-Medical and Physical Requirements.

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) Students will be required to sign a Virginia Department of Fire Programs *Notice of Acknowledgement* form verifying the students meets the course pre-requisites.
- 3) No unregistered students (walk-ins) will be allowed.
- 4) Class size is limited to 24 students.

1.7 Course Curriculum/Outline

Day 1

Instructor briefing prior to start of class (30 min)

- a. Assign workshop duties
- b. Send instructor to evaluate practical location
- c. Assign instructor to start pre-course trailer inventory

1. Introduction lecture (1 hr)

- a. Instructor and Program Introduction
- b. Paperwork
- c. NFPA Standards
 - i. 1006



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- ii. 1670
- iii. 1983
- d. Explain transition to new Pro Board accredited program
- e. Rope Rescue Safety Lecture

2. Review Knots, Bends and Hitches (1 hr)

- a. Figure 8 Stopper
- b. Figure 8 on a bight
- c. Figure 8 follow through (loop)
- d. Figure 8 bend
- e. Double Figure 8 on a bight
- f. Butterfly
- g. Clove hitch
- h. Overhand
- i. Half hitch
- j. Barrel bend
- k. Double Fisherman's
- l. Water bend
- m. Square knot
- n. Prusik hitch (TTWP)
- o. Modified Mariners hitch (LRH)

3. Rigging Systems lecture and workshops, low level (6 Hours)

- a. **Lecture (90 min)**

LUNCH

b. Construct multi-point anchor systems (6.1.1) (90 min)

- i. Double figure 8 on a bight knot
- ii. Building behind the rigging plate
 - 1. Tie backs
- iii. Anchor attachments
 - 1. Basket
 - 2. Choker
 - 3. Wrap 3, pull 2
 - 4. Rigging plate
- iv. Load sharing anchor systems
- v. Load equalizing anchor systems with rope and webbing
- vi. Change of direction
- vii. Critical angles
- viii. Adjustment Jigs / Anchor Extensions



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- c. **Construct fixed rope systems** (6.1.3) (90 min)
 - i. Load releasing hitches (LRH)
 - 1. Modified Mariner (LRH)
 - ii. Single point anchor
 - 1. TTWP with LRH with back up anchor attachments
 - 2. Anchor attachments with rope and webbing
 - a. Basket
 - b. Choker
 - c. Wrap 3, pull 2
 - 3. Three point static
 - 4. Dynamic
 - a. 8 plate
 - b. Rigging rack
 - 5. Tensionless
 - iii. Picket System
- d. **Lowering Systems** (5.5.8) (90 Min)
 - i. Main line
 - 1. Figure 8 and rigging rack
 - 2. Load releasing hitches (LRH)
 - a. Modified Mariner (LRH)
 - b. Hokie (LRH)
 - 3. TTWP
 - ii. Belay line
 - 1. LRH
 - 2. TTWP
 - iii. Passing a Knot



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Day 2

4. **Descending a fixed rope – workshop, high angle (6.1.6)(2 Hrs)**
 - a. Harness review
 - i. Proper donning and use of harnesses
 - ii. Class II and Class III harnesses
 - iii. Harness Hang Syndrome
 - b. Figure 8 and rappel rack rappels – descend at least 20 feet
 - i. At least two rappels with each device
 - ii. Belays
 1. Top Belays
 2. Bottom Belays
 3. Self Belays
 - c. Lock off each device at least twice
 - d. Self rescue each device
5. **Ascend a fixed rope - workshop, high angle (6.1.5)(2 Hrs)**
 - a. Workshop
 - i. Mechanical ascenders
 - ii. Prusik ascenders
 - iii. Rigging ascending system
 1. Frog System
 - b. Practical evolutions
 - i. Ascend at least 20 feet with mechanical ascender system
 - ii. Ascend at least 20 feet with prusik ascender
 - iii. Minimum two points of contact to fixed line from harness attachment

LUNCH

6. **Patient Pick Off – workshop, high angle (6.2.4)(2 Hrs)**
 - a. Patient suspended from rope at a minimum height of 20 feet
 - b. Rescuer contacts patient via a rappel using rappel rack
 - c. Rescuer transfers patient from patient's rope to the rescue system
 - i. Patient is not connected to rescuer's harness
 - d. Patient and rescuer move at least 20 feet vertically to a safe location



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- e. Every student must serve as a rescuer, patient, and as team leader for an operation



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7. Change Overs – workshop, high angle (6.1.5)(2 Hrs)

- a. From Ascending to Descending
 - i. Rescuer ascends minimum of 20 feet
 - ii. Rescuer places descent control device (DCD) on rope as close as possible to lowest ascending system attachment
 - iii. Rescuer attaches to(DCD) and locks off(DCD)
 - iv. Rescuer stands in foot attachment and removes lower attachment and loads DCD
 - v. Rescuer unlocks DCD prior to removing last attachment to ensure proper attachment
 - vi. Rescuer is now ready to begin rappel
- b. From Descending to Ascending
 - i. Stop rappel a minimum of 3 feet above ground and lock off DCD
 - ii. Attach top ascender to rope above DCD
 - iii. Step up into foot attachment and attach lower ascender to rope between top ascender and DCD
 - iv. Rescuer transfers weight to ascending system
 - v. Unlock and remove DCD from rope
- c. Down Climb with Ascenders
 - i. Rescuer uses ascending system in reverse order of climb to move to ground

Day 3

8. Mechanical Advantage Systems (4 Hr)

- a. **Lecture** (6.1.2)(1 Hr)
 - i. Review mechanical advantage theory
 - ii. Review Simple Mechanical Systems
 1. 1:1,2:1, 3:1, 4:1, 5:1, Counterbalance
 - iii. Introduce “compound” systems
 1. 4:1, 6:1, 9:1
 - iv. Review piggybacking of MA systems
- b. **Workshop** – low level (6.1.2)(3 Hr)
 - i. Construct mechanical advantage systems



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1. Simple 2:1, 3:1, 4:1, 5:1
2. Compound 4:1, 6:1, 9:1
- ii. Piggyback to mainline
- iii. Mainline 3:1 z-drag MA
- iv. Set of fours (small 4:1 MA)
- v. Construct belay line for a haul system
- vi. Operate piggybacked and mainline 3:1 z-drag mechanical advantage systems and belay line in a haul operation

Lunch

- c. **Practical** – high angle (6.1.2, 6.1.4)(1 Hr)
 - i. Construct simple, compound and 3:1 z-drag mechanical advantage systems
 - ii. Operate mechanical advantage systems in a coordinated high point pendulum drill
 - iii. Direct the operation of mechanical advantage systems in a coordinated high point pendulum drill. (if time and site allow)
9. **Patient Packaging and workshops, low level (3 Hrs)**(60 minutes for each section a, b and c **(6.2.2, 6.2.3, 6.2.4)**)
- a. Stokes integrated harness system
 - b. Yosemite rig and litter attending
 - c. LSP and Spec Pack

Day 4

10. **Practical Evolutions – high angle (6.2.1, 6.2.2, 6.2.3)**(6 Hrs)
- a. Stokes Operation in high angle environment
 - i. Secure patient in stokes litter.
 - ii. Attach stokes to lowering system or haul system via a Yosemite Rig
 - iii. Move the patient in stokes litter at least 20 feet vertically with a litter tender attached to the system.
 - iv. Every student must serve as a rescuer for an operation
 - b. Scenario based practical evolutions



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- i. Incorporate the delivered skills
- ii. Critical thinking
- iii. Team and incident leadership
- iv. Students are to rotate through team positions

11. Trailer Inventory and Course Completion Paperwork

1.8 Reference Material and Supplemental Information

Rope Levels I and II, Matthews, Delmar, 2009

1.9 Course Completion Requirements for Students:

- 1) Students are required to attend 100% of the classroom and practical sessions.
- 2) Successful completion of all required skills as indicated in the course outline.
- 3) Students are required to successfully complete a “Skills Task Book”. Each skill is pass/fail, with two opportunities to complete each skill.