



# NATIONAL RAPPEL OPERATIONS GUIDE

## Appendix A

Rappel Training Syllabus

Version 6

6.9.2019

USDA FOREST SERVICE

## Appendix A – Rappeller Training Syllabus (V6) 6.6.19

### Introduction

#### I. Responsibilities

##### A. Check Spotters

1. Ensure rappellers are ready prior to moving to the next stage
2. Ensure performance-based standards are being applied accordingly
3. Provide oversight and ensure proficiency of qualified and trainee rappel spotters
4. Ensure NROG compliance
5. Ensure GAR risk assessment is completed prior to live rappelling

##### B. Lead Trainers

1. Accountable for the preparation of the units instructing, including training aids and items such as A/V equipment, rigging and demo rappellers
2. Intentions to the demo rappellers must be clearly explained

##### C. Spotters

1. Ensure standardization at all levels
2. Assist lead trainers in all facets

##### D. Spotter Trainees

1. Continue at current trainee status as directed by the rappel check spotter group
2. Assist the lead instructor as assigned
3. Trainee spotter will not be allowed to spot live helicopter rappels for initial training

##### E. Demo Rappellers

1. Each demo rappeller shall receive a briefing from the lead trainer prior to demonstration
2. Demo rappellers are responsible for demonstrating correct rappel procedures to rappellers

##### F. Squad Leaders

1. Squad leaders are accountable for tracking rappellers' progression through all stations, communicating with lead instructors, and maintaining the wellness of squad
2. They are responsible for documentation of assigned individuals

##### G. Equipment Division

1. Overall command of equipment – ensure adequate amount of personnel and equipment are available to support training

##### H. Equipment Inspections Lead

1. Supervise equipment inspectors to ensure all rappel equipment is appropriately inspected and logged prior to returning it to service
2. Ensure adequate number of ropes and descenders are available to facilitate rappel operations for the assigned group

## I. Documentation Lead

1. Ensure all rappels are properly documented on a rappel report and filed for later updates to electronic documentation (paper copies are required)

## II. Lesson Plan

### A. Chapter Summary

Lesson 1 - Equipment Orientation, Inspection, Care, Issue, Fit and Suspension (Home Unit)

Lesson 2 - Program Overview and Equipment Review

Lesson 3 - Buddy Checks

Lesson 4 - Ground Training

Lesson 5 - Spotter Checks

Lesson 6 - Ground Simulator

Lesson 7 - Elevated Simulator

Lesson 8 - Emergency Procedures

Lesson 9 - Helicopter Mock-Ups

Lesson 10 - Helicopter Rappels

### B. Daily Operations Schedule

Day 1	Day 2	Day 3	Day 4	Day 5
<b>0800- 0830</b>	<b>0800- 0830</b>	<b>0800- 0830</b>	<b>0800- 0830</b>	<b>0800- 0830</b>
Briefing	Briefing	Briefing	Briefing	Briefing
<b>0830 – 0930</b>	<b>0830-1200</b>	<b>0830-1200</b>	<b>0830-1200</b>	<b>0830-Finish</b>
Program Overview and Equipment Review	Ground Simulator	Elevated Simulator	Mock-Ups	Live Rappels 4-8
<b>0930-1200</b>	<b>1200-1230</b>	<b>1200-1230</b>	<b>1200-1230</b>	
Buddy Checks	Lunch	Lunch	Lunch	
<b>1200-1230</b>	<b>1230-1730</b>	<b>1230-1730</b>	<b>1230-1730</b>	
Lunch	Ground Simulator	Elevated Simulator	Live Rappels 1-3	
<b>1230-1600</b>				
Ground Training				
<b>1600-1730</b>				
Spotter Checks				

## Lesson 1 - Equipment Orientation, Inspection, Care, Issue, Fit and Suspension

### I. Objectives

- Complete Lesson 1 at home unit prior to attending National Rappel Academy
- Explain purpose and care of equipment
- Instruct rappellers how to properly inspect rappel equipment
- Introduce rappellers to the NROG, Chapter 4, for equipment inspection criteria
- Explain equipment repair and retirement decision responsibilities
- Introduce rappellers to equipment and inspection logs
- Develop rappellers' confidence in the equipment
- Ensure harness fit and tack the harness as needed
- Familiarize rappellers with harness while weighted
- Demonstrate proper donning/doffing of the rappel equipment

### II. Training Aids

PowerPoint presentation, equipment listed below in "Equipment Orientation", Rappel Report, Rappel Equipment Inspection Form, Ropes attached to solid, stable, and raised position (e.g. pull-up bar), personal rappel gear, full PPE, and BD bag

### III. Responsibilities

#### A. Lead Instructor

1. Present PowerPoint
2. Provide examples as appropriate
3. Show rappellers how to fill out the Equipment Inspection Form

### IV. Rappel Equipment Introduction

All equipment will be monitored and life expectancy requirements will be followed in order to maintain an adequate margin of safety

Equipment approval process is identified in Appendix D of the NROG

Any questions or concerns as to the condition or safety of equipment shall be directed to a spotter

#### A. Equipment Orientation

Introduce each equipment item, explaining its purpose where necessary

- a. Helmet
- b. Eye protection
- c. Fire-resistant clothing
- d. Rappel gloves
- e. BD bag
- f. Rock Exotica RockD Carabiner (life-bearing only)
- g. Rock Exotica RockD Lanyard Pin Carabiner (life-bearing only)
- h. SMC Lite Stainless-Steel Locking (Bright) Carabiner (cargo only)
- i. Rappel harness
- j. Spotter harness

- k. Knife
- l. Descender
- m. 250 foot rope
- n. 300 foot rope with tracer
- o. Rappeller tether
- p. Spotter anchor
- q. Rescue Figure 8

## V. Suspension

### A. Responsibilities

1. Equipment
  - a. Set up ropes at each station
  - b. Have platforms available at each station
2. Lead Instructor
  - a. Brief on intent of station; inform rappellers on how the station will be conducted
  - b. All PPE is required
  - c. Follow outline below
  - d. Demo the suspension process
  - e. Do not cover any procedures or hand signals
3. Spotters
  - a. Use carabiner to attach to a suspended rope **not** using a rigged descender.
  - b. Inform rappeller if and where adjustments are needed to the rappel harness
  - c. Tack harness if needed

## VI. Field Practical

### A. Order of procedures

1. Rappeller dons rappel equipment
2. Spotter checks rappeller and then rappeller steps up on platform
3. Spotter suspends rappeller via harness carabiner
4. Rappeller moves into suspension, harness adjustment if necessary
5. When suspension is complete, rappeller again stands on platform and spotter removes rappeller from suspension
6. If adjustments are needed, have rappeller repeat suspension stage

## Lesson 2 - Program Overview and Equipment Review

### I. Objectives

- Introduce cadre
- Cover mission statement and history
- Introduce performance-based training

### II. Training Aids

NROG and PowerPoint presentation and equipment listed below in “Equipment Review”

### III. Course Delivery

#### A. Introduction

All available spotters, squad leaders, and specific rappel class complete introductions, JHAs, safety message, general housekeeping rules, squad assignments, and the week’s objectives.

#### B. Background and History

Utilize PowerPoint

#### C. Change Blindness

The term “change blindness” refers to the difficulty observers have in noticing large changes to visual scenes. Once the mind is conditioned to seeing something one way, changes can be hard to detect, especially when the change is unexpected. The training focuses on the correct manner of rigging the descender and the way the rappel equipment should look for rappel operations.

To reinforce the correct rigging, the rappeller will be introduced to how equipment can be misrigged. The intent is to teach the correct configuration and to reinforce the correct configuration by allowing the rappeller to see the incorrect configuration. In summary, allowing the mind to see both the correct and incorrect configurations helps condition the mind for noticing changes that may normally go unnoticed.

A check spotter shall have the responsibility of instructing or directly overseeing this portion of the training. Two spotters will be knowledgeable of the misrigging of rappel equipment. Spotters who have misrigged equipment will monitor situation for when the error should have been identified. If an error is identified, the error will be corrected at that point and rechecked by both the spotter and rappeller. If a spotter starts a simulator cycle with misrigged equipment, he/she will finish the cycle before changing spotters. No change blindness training will be conducted without check spotter approval.

1. At the discretion of the check spotter, a spotter on the ground will start introducing errors in a rappeller's equipment, to be caught during buddy checks. The rappeller whose equipment has been misrigged must have knowledge of the misrigging.
  2. Any alterations to the harness connecting hardware must follow the inspection guidelines found in the NROG, Chapter 4.
  3. At the discretion of the check spotter, spotter(s) will introduce errors in the rigging and equipment for the rappellers to detect during the equipment checks. Errors may be introduced in any of the rigging.
  4. For spotter safety, no intentional misrigging of spotter equipment or attachment hardware will be used on the elevated simulator.
  5. When appropriate, and at the discretion of the check spotter, spotters will commence incorrect hand signals.
  6. No change blindness will occur during the final mock-up or live rappels.
- D. Performance-Based Training
1. Initial Rappeller Training: Rappellers must demonstrate competency before moving on to the next lesson as determined by the check spotter. The criteria for each lesson is listed in this training aid. Failure to pass any lesson will lead to removal from the training.
  2. Classroom Training (Equipment Review/Buddy Check/Spotter Check): Pass/Fail – to be determined by the evaluating spotter. The rappeller must meet the objectives in this rappel training syllabus prior to moving on to ground training.
  3. Ground Training: Pass/Fail – to be determined by the evaluating spotter. The rappeller must meet the objectives in this rappel training syllabus prior to moving on to ground simulator training.
  4. Ground Simulator, Elevated Simulator, and Mock-Ups: A system of penalties (see errors) is incorporated into rappel training starting at ground simulator training. During ground simulator training, penalties will not be assessed until stage two. During the elevated simulator training, penalties will not be applied until the rappeller has completed one elevated rappel. Evaluating spotters will determine what action is required. Three minor penalties constitute one major penalty. After three majors, the rappeller's immediate removal from training will be issued by the check spotter, and the rappeller's supervisor will be informed.
  5. Helicopter Rappels: During live rappels, one major or three minors (regardless of previous penalties) will be grounds for a rappeller's immediate removal from training. Evaluating spotters will not allow the rappeller to continue. The rappeller's removal will be approved by the check spotter and the rappeller's supervisor will be informed. Continual errors accrued in prior phases of training (#4 above) are carried over into the live rappels.

## E. Error Definitions

Listed examples may not capture every error that may result in a penalty. Evaluating spotters must identify when an error is made and determine what, if any, penalty should be assessed.

### 1. Majors:

Mistakes made by the rappeller that, if left uncorrected, could cause serious injury or death to the rappeller or put the aircraft and crew at serious risk.

### 2. Minors:

Mistakes made by the rappeller which, if left uncorrected, could jeopardize or delay the rappel procedure and/or damage equipment or PPE.

### 3. Continual Error:

A continual error is defined as an error that occurs three or more times. After two warnings for the same error, the third occurrence and any thereafter are considered continual errors. From this point forward a penalty will be given.

### 4. Resetting:

Majors and minors reset when moving into live rappelling. However, continual errors DO NOT reset. For example, if a rappeller has three or more continual errors prior to live rappelling, such as continual descent problems, and the rappeller is assessed an error for descent problems during live rappels, then that error is assessed as a major penalty.

The same goes for all continual errors that have occurred from the start of training. For example, if an individual has two assessed continual errors for exit problems and if they have an exit problem in live rappelling, they would be issued a minor, as it is the third continual error.

### 5. Self-Correction:

If a rappeller self-corrects after committing an error, the appropriate penalty will still be assessed.

### 6. Consistency:

Each class will assess penalties consistent with the first rappel training class of that session.



## F. Errors That Invoke Penalties

**Majors:** Mistakes made by the rappeller that, if left uncorrected, could cause serious injury or death to the rappeller or put the aircraft and crew at serious risk.

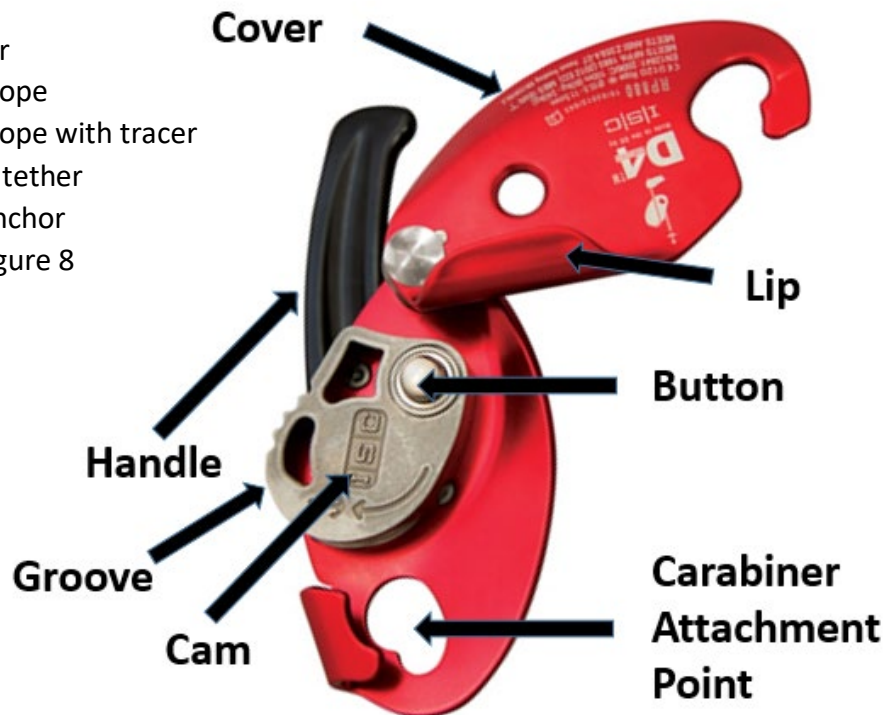
- a. Harness leg strap unbuckled or buckled outside of leg
- b. Presenting misrigged descender
- c. Moving without spotter's signal
- d. Rappelling when given the return to seatbelt signal
- e. Severe landing (injury or fall to backside)
- f. Continual descent problems
- g. Excessive speed
- h. On-rope situational awareness (knots, trees, slope, terrain)
- i. Continual emergency procedure problems (failure to complete process correctly, i.e.: incorrect tie-off, failure to cut rope below rappeller, incorrect hand signals from rappellers to spotter, etc.)
- j. Indecisiveness
- k. Continual inadequate rappel site situational awareness
- l. Rappelling past a problem (limb-over, missing the hole, etc.)
- m. Slope and obstacle assessment
- n. Inappropriate, or lack of response that would most likely end in injury or death

**Minors:** Mistakes made by the rappeller which, if left uncorrected, could jeopardize or delay the rappel procedure and/or damage equipment or PPE.

- a. Buddy Check
  - i. PPE missing, in poor condition or incorrectly worn (includes hair not tucked, harness poorly adjusted, leg strap buckled backwards)
  - ii. BD bag incorrectly worn (compression strap outside handle, click lock horns not out, zipper not closed)
  - iii. Webbing bridge twisted
- b. Continual equipment inspection deficiencies (Rappel rigging, Spotter check, etc.)
- c. Continual rigging sequence out of order from "Remove Seatbelt" signal to beginning of self-inspection.
- d. Not completed descender self-inspection
- e. Continual misrigging of ancillary equipment (i.e. rappeller tether, seatbelt. etc.)
- f. Inappropriate, or lack of, response to spotter's hand signal
- g. Continual exit problems (from seat to skid)
- h. Continual exit problems (from skid through transition off skid)
- i. Continual landing problems (no slowing down, knee, step out, stepping on rope)
- j. Improper treatment of rappel equipment (not properly stowing rappel equipment)
- k. Procedures out of order (Releasing rappeller tether before moving to the skid)

## G. Equipment Review

1. Review each equipment item, stating its purpose where necessary
  - a. Helmet
  - b. Eye protection
  - c. Fire-resistant clothing
  - d. Rappel gloves
  - e. BD bag
  - f. Rock Exotica RockD Carabiner (life-bearing only)
  - g. Rock Exotica RockD Lanyard Pin Carabiner (life-bearing only)
  - h. SMC Lite Stainless-Steel Locking (Bright) Carabiner (cargo only)
  - i. Rappel harness
  - j. Spotter harness
  - k. Knife
  - l. Descender
  - m. 250 foot rope
  - n. 300 foot rope with tracer
  - o. Rappel tether
  - p. Spotter anchor
  - q. Rescue Figure 8



## Lesson 3 - Buddy Checks

### I. Objectives

- Demonstrate proper buddy check without error

### II. Training Aids

Buddy check PowerPoint, suitable open area, scale for rappeller weights

### III. Responsibilities

#### A. Demonstrators

1. Two veteran rappellers for demonstration purposes, one in a flight suit, one in Nomex clothing.

#### B. Lead Instructor

1. Walk through buddy check utilizing demo rappellers
2. Let rappellers know that everything is to be verbalized out loud
3. Use the buddy check guide below for instructions
4. If a discrepancy is found during this check, the discrepancy needs to be corrected and the buddy check started over from the beginning

#### C. Check Spotter

Determine when to introduce misrigging of rappeller

1. Demonstration of incorrect rigging of rappeller equipment may include the following or additional examples:
  - i. Leg strap undone, outside of leg, or strap twisted
  - ii. Knife locked backwards
  - iii. Webbing bridge twisted
  - iv. Rappel gloves with holes
  - v. Zipper unzipped

### IV. Field Practical

Instructor will now start individual rappeller instruction on procedures

Instructor reads buddy check verbiage as rappeller performs checks.

Each rappeller performs one with verbiage being read aloud.

Rappellers shall follow the buddy check sequence as demonstrated

## A. Buddy Check Demonstration

Veteran rappellers will demonstrate the correct buddy check steps

Note: Items noted below in **bold** must be checked both visually and tactilely

Buddy check with instructor notes (*italicized words in parentheses are for instructing purposes only and not verbalized as part of the check*)

1. Flight helmet
  - a. In good condition (no cracks or damage)
  - b. Visor down or up with eye protection (*that meets ANSI Z87.1*)
  - c. Mic boom up (multiple mic booms exist and can be visually inspected for correct placement)
  - d. Chin strap in place (adjusted for snug fit, no loose ends)
  - e. Avionics cord secured (inside collar of Nomex shirt or flight suit)
2. Nomex top
  - a. Shirt collar up, buttoned to the top and tucked in, or flight suit fully zipped
  - b. Pockets secured
  - c. Sleeves down
3. Rappel gloves
  - a. **Gloves in good condition** (free of pitch or contaminants, stitching and padding intact with no holes in palms, between fingers, flap, or thumb/forefinger gusset)
4. Harness
  - a. Risers
    - i. Snug fit
    - ii. Webbing and stitching in good condition
    - iii. No twists
    - iv. Loose ends secured
  - b. Lat straps
    - i. Snug fit
    - ii. Webbing and stitching in good condition
    - iii. No twists
    - iv. Loose ends secure
  - c. Webbing bridge
    - i. Webbing and stitching in good condition
    - ii. No twists
  - d. Carabiner and descender
    - i. **Gate closed and locked**
    - ii. **Lanyard pin in place**
    - iii. **Descender attached**

5. BD bag
  - a. **Click locks secured, horns out**
  - b. Top straps through handle, buckles secured
  - c. Side straps tight
  - d. Zipper closed
  - e. Double tap on BD bag to indicate rappeller to lift bag
  - f. Bottom of BD bag in good condition
6. Leg straps
  - a. Buckles attached, no fabric caught
  - b. Snug fit
  - c. Webbing and stitching in good condition
  - d. No twists
  - e. Loose ends secured
7. Raptor knife
  - a. **In sheath**
  - b. **Snaps secured**
  - c. **Lanyard stowed**
  - d. **Horn facing aft**
8. Nomex pants
  - a. Pockets secured
  - b. Pants over boots
9. Single tap on BD bag to signal rappeller to turn around
10. Helmet in good condition (*No cracks or damage*)
11. Hair tucked in
12. Harness
  - a. Webbing and stitching in good condition
  - b. No twists
  - c. Loose ends secure
  - d. Tag pouch secure
13. Nomex
  - a. Waist belt clear
  - b. Pockets secured
14. Indicate rappeller to turn around with a single tap on the left shoulder
15. Exchange thumbs-up indicating a complete buddy check

#### B. Buddy Check with Rappellers

Have rappellers perform buddy checks following guidelines above

## Lesson 4 - Ground Training

### I. Objectives

- Demonstrate basic relationships between rappel equipment
- Develop individual confidence and proficiency in handling the descender and rope

### II. Training Aids

Training ropes attached to an elevated immovable object and suitable open area

### III. Responsibilities

#### A. Equipment Division

1. Set up training structures with ropes

#### B. Lead Instructor

Demonstrate method to rig and derig descender

1. Demonstrate rappel using the following curriculum:
  - a. Verbalization
  - b. Mechanics of descender
  - c. Hand position on rope
  - d. Looking down the rope
  - e. Don't step on rope

#### C. Check Spotter

1. Oversee training of rappellers for standardization and proficiency
2. Incorporate change blindness training as appropriate

### IV. Field Practical

#### A. Stage One - Stationary

One rappeller per rope

Instruction and demonstration for rappellers on how to properly rig, inspect and derig descender

1. Rigging
  - a. Descender in left hand
  - b. Unlock handle
  - c. Push button in and open cover
  - d. Grasp rope with right hand, thumb towards anchor
  - e. Route rope clockwise around cam
  - f. Close cover, button out
  - g. Lock handle

## 2. Inspecting

During inspection, have the rappeller inspect the descender while holding the rope to the ground, alternating hands throughout the lesson.

- a. Rope from anchor, enters at groove
- b. Carabiner captured
- c. Button out
- d. Rope exits at bobbin
- e. **Handle locked**
- f. Rappeller waits be inspected by spotter
- g. Spotter check:
  - i. Rope from anchor, enters at groove
  - ii. Carabiner captured
  - iii. Button out
  - iv. Rope exits at bobbin
  - v. **Handle locked**

## 3. Derigging

- a. Unlock handle
- b. Push button in and open cover
- c. Remove rope
- d. Close cover

## 4. Rappeller demonstrates process, spotter inspects each rigged descender, then spotter instructs rappeller to derig and repeat

## B. Stage Two – Suspension

### 1. Spotter briefs the following:

- a. BD bag is utilized
- b. Everything is verbalized aloud
- c. Right hand positioned near the descender to route rope over the lip
- d. Looking down the rope
- e. Braking
- f. Rope on right side of body
- g. Avoid stepping on rope

3. Instructions and demo for rappeller suspension
  - a. Climb stairs and stand with rope in front of body
  - b. Rig descender, inspect, and then wait to be inspected by spotter
    - i. During the inspection, have rappeller inspect the descender while holding the rope to the ground alternating hands (to simulate outboard hand on rope)
  - c. Spotter checks descender and then places rappeller in suspension with left hand on descender with handle in locked position.
  - d. Spotter instructs rappeller to move handle with left hand to primed position.
  - e. With right hand just below the descender, tunnel rope over lip, rappeller looking over right shoulder, brake, and repeat until they reach the ground.
  - f. Once on ground, rappeller manipulates cam with thumb to gain slack, opens cover, and removes rope to derig descender.
  - g. Have the rappeller complete steps a-f until competency is obtained.
- C. Stage Three – ISC D4 Descender - Panic Stop Feature
  1. Spotter briefs the following:
    - a. Lead instructors will have all rappellers hold their descenders in left hand with the cover open exposing the cam. Demonstrate how when the handle is rotated around it will eventually initiate the panic stop. After the panic stop initiates demonstrate the two ways to recycle the handle. 1) Counterclockwise until the device recycles and then continue rappel. 2) Clockwise until the handle locks and then continue rappel.
    - b. A demo rappeller will then stand at a suspension station with a spotter and rig the descender. With the spotter holding the rope to simulate rope weight the rappeller will initiate the panic stop. The rappeller will then cycle the handle to continue the rappel both ways.
    - c. Have the rappeller complete process until competency is obtained.
- D. Stage Four – Misrigged Descenders
  1. Spotter briefs the following:
    - a. Instructor shall demonstrate to rappellers the way the descender can be incorrectly rigged and dangers associated with a non-arrested fall to the ground.
    - b. Each rappeller will inspect the descender from a first-person point of view and notify spotter if misrigged.
    - c. The last descender seen by rappeller will be a rigged correctly





*Descender rigged correctly*



*Descender rigged backwards*



*Descender rigged with carabiner captured in groove*



*Descender rigged with rope between cover*



*Rigged with the rope into the carabiner attachment point (CAP) three ways. From left to right: from anchor into the CAP, from anchor in the groove and out the CAP, rigged backwards and out the CAP.*

## Lesson 5 - Spotter Checks

### I. Objectives

- Demonstrate proper spotter check without error

### II. Training Aids

Personal spotter gear

Suitable open area

### III. Responsibilities

#### A. Demonstrators

1. Veteran rappeller and one fully dressed spotter (demonstrator spotter does not need to be a qualified spotter but does not interact with the instruction).

#### B. Lead Instructor

1. Walk through spotter check utilizing demo rappeller and spotter
2. Let rappellers know that everything is to be verbalized out loud
3. Use the spotter check guide below for instruction
4. If a discrepancy is found during this check, the discrepancy needs to be corrected and the spotter check started over from the beginning

#### C. Check Spotter

1. Determine when to introduce incorrect rigging of spotter
2. Demonstration of incorrect rigging of spotter equipment may include the following or additional examples:
  - a. Leg strap undone or outside of leg
  - b. Knife stowed backwards
  - c. Spotter tether incorrect

### IV. Field Practical

Instructor(s) will now start individual rappeller instruction on procedures

Rappellers shall follow the spotter check sequence as demonstrated

Spotter Check Demonstration:

Veteran rappellers will demonstrate the correct spotter check steps

No tactile checks

*Italicized words in parentheses are for instructing purposes only and not verbalized as part of the check*

## A. Spotter Check with Instructor Notes

1. Flight helmet
  - a. In good condition (no cracks or damage, avionics in place, no eye protection required)
  - b. Chin strap in place
2. Nomex shirt
  - a. Shirt collar up, buttoned to the top and tucked in, or flight suit fully zipped
  - b. Sleeves down
3. Gloves
  - a. In good condition (Nomex flight glove, PMI GS2200 or Metolius climbing  $\frac{3}{4}$  finger with Nomex flight gloves. Gloves shall have no holes and be free of contaminants)
4. Harness
  - a. Chest and leg straps buckled
  - b. Snug fit
  - c. Webbing and stitching in good condition
  - d. No twists
  - e. Loose ends secured
5. Nomex pants
  - a. Pants over boots
6. Raptor knife
  - a. In sheath
  - b. Snap secured
  - c. Lanyard stowed
  - d. Horn facing to the left
7. Signal spotter to turn around with a tap on the knife sheath
8. Helmet in good condition
9. Harness
  - a. Webbing and stitching in good condition
  - b. No twists
  - c. Loose ends secured
  - d. Spotter tether attached to dorsal D-ring and tacked
  - e. Extendable tether locked, and snaps secured
  - f. Carabiner in place at end of tether
10. Signal spotter to turn around with a single tap on the left shoulder
11. Exchange thumbs-up indicating a complete spotter check

## B. Spotter Check for Rappellers

Instruct rappellers to perform spotter checks using the guidelines above.

## Lesson 6 - Ground Simulator

### I. Objectives

- Identify helicopter configuration
- Demonstrate inspection of rappel equipment
- Identify and demonstrate proper seating configuration
- Demonstrate spotter equipment check
- Identify and respond to spotter hand signals
- Demonstrate confidence and proficiency with equipment and procedures
- Demonstrate rappel procedures without procedural error or hesitation

### II. Training Aids

Rappel configured Bell medium helicopter or simulator

### III. Minimum Requirements

A minimum of 8 ground simulations

A minimum of 1 error-free cycle from each seat

A minimum of 1 error-free re-entry from each side (a successful re-entry will count as an error free cycle)

### IV. Responsibilities

#### A. Demo Rappellers

1. Veteran rappellers shall perform ground simulator demo at the beginning of Stage Two and Stage Three
2. Lead instructor shall narrate the process

#### B. Lead Instructor

1. Perform status check with group, answer any questions
2. Introduce new hand signals and describe what they mean
3. Brief that each rappeller shall receive their own signal; no movement without a signal
4. Cover first rappeller rigging check
5. Rappel anchor - what to look for and how it is rigged
6. Cover last rappeller spotter check
7. Discuss rope control over the lip of descender and how to accomplish
8. Teach foot trap technique
9. Discuss adjusting descender for proper skid height
10. Discuss clearing the rope when transitioning to skid
11. Introduce "Ready Position" with the left hand on descender and right hand on rappeller tether release
12. Cover additional discussion topics with trainers prior to beginning

#### C. Check Spotter

1. Penalties will be assessed after the rappeller's fourth ground simulator cycle.
2. Change blindness will be utilized at the discretion of the check spotter and be clearly communicated to all cadre and rappellers in the class.

**D. Spotters**

1. Monitor rappellers' progress through ground simulator training
2. Coordinate with lead instructor on meeting objectives of training
3. Monitor rappellers for fatigue and allow for breaks

**V. Introduction of Hand Signals****A. Thumbs-up**

Exchanged between rappeller and spotter during boarding sequence and equipment inspections to indicate a completed check.

**B. Rappeller Tap**

Used by spotter to acknowledge that inboard rappellers have checked rappel rigging. Spotter taps inboard rappeller(s) and points to anchor; rappeller(s) give Thumbs-up if rigging has been checked.

**C. Remove Seatbelt**

Given by spotter to each rappeller. Rappeller removes seatbelt and slides to edge of seat, rigs descender, and presents with outboard hand on the rope to the ground, and inboard hand on rappeller tether (not release).

**D. Move to Skid**

Given by spotter to each rappeller. Rappeller moves from seat to skid, squares up on skid with the rope on the right side of body, moves to primed position, visually clears the rope to the ground, places right hand on rappeller tether release and returns eyes to the spotter.

**E. Begin Descent**

Given by spotter to rappeller(s). Rappeller(s) removes rappeller tether and begins descent with rope over lip.

**VI. Additional Ground Simulator Points to Cover**

Introduce hand placement while spotter is checking seatbelts and rappeller tethers.

Rappellers do not need to buckle seatbelt behind them.

Introduce foot trap while rigging descender.

Emphasize the three-step technique to reach the skid, no double-stepping the flight step.

Introduce the use of the outboard hand on the rope to the ground and inboard hand on the rappeller tether when presenting.

Utilize the rope as a handhold and not the carabiners or the door.

## **VII. Ground Simulator – Stage One**

- A. Introduce how the following equipment is set up inside the ground simulator
  - 1. Rock Exotica RockD Carabiner (life-bearing only)
  - 2. Rope
  - 3. Rappeller tether
  - 4. Seatbelt
  - 5. Rappel anchor
  - 6. Spotter anchor
- B. Show how the equipment is inspected by the first rappeller to load, on each side.
- C. Demonstrate and have rappellers wear the rappeller tether and seatbelt.

## **VIII. Ground Simulator – Stage Two**

- A. Rappellers perform buddy check
- B. Spotter checks the rappellers outside the simulator
- C. First rappellers to board simulator on each side perform visual and tactile checks on equipment, move into seat, fasten rappeller tether to inboard side of the webbing bridge with release handle facing downward (tether shall not cross rappeller's body), and then attach seatbelt (under descender and tether)
- D. Last rappeller loaded performs spotter check and gives "thumbs-up" (rappeller to verbalize what is being checked on spotter)
- E. Spotter checks rigging, taps inboard rappeller(s), points to anchor, and gets "thumbs-up" signal
- F. Spotter checks rappeller tethers and seatbelts with rappellers' BD bags between legs, outboard hand holding descender, and inboard hand by helmet
- G. Spotter attaches spotter tether, takes seat, connects seatbelt
- H. Spotter presents attached carabiner to rappellers, rappellers confirm and exchange "thumbs-up" signal
- I. Outboard rappellers will secure rope bags
- J. Spotter removes seatbelt and moves into position
- K. Spotter opens doors and deploys ropes

- 
- L. Spotter gives rappeller “Remove Seatbelt” signal (one rappeller at a time)
1. Rappeller:
    - a. Removes seatbelt and slides to edge of seat
    - b. Rigs descender with foot trap utilizing outboard foot
    - c. Inspects rigged descender, with outboard hand grasping free end of rope (rope going to ground) and inboard hand inspecting descender
      - i. Rope from anchor, enters at groove
      - ii. Carabiner captured
      - iii. Button out
      - iv. Rope exits at bobbin
      - v. **Handle locked**
    - d. Presents with outboard hand on the rope to the ground and inboard hand on rappeller tether between harness and seatbelt ring (not release)
- M. Spotter tactilely inspects rigged descender and visually ensures the rappeller tether is attached.
1. Rope from anchor, enters at groove
  2. Carabiner captured
  3. Button out
  4. Rope exits at bobbin
  5. **Handle locked**
  6. Rappeller tether attached
- N. Spotter gives “Move to Skid” signal (one rappeller at a time)
1. Rappeller:
    - a. Moves from seat to skid
    - b. Squares up with rope on the right side of body
    - c. With left hand, moves handle to primed position
    - d. Visually clears the rope to the ground
    - e. Places right hand on rappeller tether release
    - f. Return eyes to the spotter in ready position
- O. Spotter gives “Begin Descent” signal
1. Rappeller:
    - a. Releases rappeller tether
    - b. Begins transitioning off of skid looking at the anchor
- P. Once on ground, rappeller manipulates cam with thumb to gain slack, opens cover, and removes rope to derig descender

## IX. Ground Simulator – Stage Three

### A. Additional Hand Signals

Brief the following new material and use demo rappellers, then continue ground simulator training as outlined above.

#### 1. Return to Seatbelt

Given by spotter to indicate rappellers should return to seat and buckle seatbelt. The inboard rappeller may assist the outboard rappeller back into seat and seatbelt. May require a derig or rope cut.

#### **NOTE - Demonstration Rappellers**

At completion of demo cycle, one rappeller will demonstrate the sequence with a misrigged descender and/or demonstrate an attempted rappel with rappeller tether attached.

#### a. Additional re-entry points to cover

- i. Must re-enter the aircraft the same way as exited, utilizing the three-step process in reverse.
- ii. Utilize the rope between carabiner and descender as additional aid if needed.
- iii. Do not grab door or carabiners to assist aircraft re-entry.
- iv. A “Return to Seatbelt” signal may be given at any time after the seatbelt has been removed. Trainers should utilize this signal throughout the rappel sequence. However, rappellers must be in ready position on the skids to count as a re-entry for minimum training requirements.
- v. Do not pull on handle or rappeller tether when returning to seatbelt.



## **Notes**

## Lesson 7 - Elevated Simulator

### I. Objectives

- Demonstrate proficiency in the exit from simulator
- Demonstrate controlled descent
- Demonstrate proper braking techniques
- Demonstrate proper landing
- Demonstrate proper knot procedures
- Demonstrate proper ETO procedures
- Rappeller will practice cutting an unloaded rope held by an instructor

### II. Training Aids

Elevated simulator (minimum 20' above ground), training ropes, full PPE  
JHA, and elevated simulator safety plan

### III. Minimum Requirements

- During elevated training, each rappeller will perform a minimum of 10 static-line rappels.
- 3 weighted knots, 2 weighted ETOs (a weighted knot during an ETO will count toward total weighted knots), and 1 weighted re-entry from each side.
- Penalties will not be assessed until after one rappel is completed off of the elevated simulator.

### IV. Outline of Rappels:

- \* Demo elevated simulator rappel  
First stick does a complete weighted rappel. Second stick does a weighted rappel with knot. Introduce the "Knot-in-Rope" signal (finger pointing down the rope) and response (head nod). Emphasize that this can come from the spotter or the rappeller.

- 1 Weighted with mid-line stop (no penalties)
- 2 Weighted (penalties assessed from this point forward)
- 3 Weighted Knot

Re-entries (minimum of one from each side)

- \* Demo Suspension ETO  
Suspension ETOs

- \* Demo Elevated Simulator ETO

- 4 Weighted ETO
- 5 Weighted ETO
- 6 Non-Weighted
- 7 Non-Weighted Limb Over (left side)
- 8 Non-Weighted High Wind (right side)
- 9 Non-Weighted (optional typical terrain landing)
- 10 Non-Weighted (optional typical terrain landing)

## **V. Responsibilities**

### **A. Demonstrators**

1. Lead instructor shall narrate the process.

### **B. Equipment Division**

1. Set up elevated simulators with ropes, carabiners, seatbelts, rappeller tethers, and spotter anchors.
2. Ensure completion of the tower inspection

### **C. Lead Instructor**

1. Cover JHA and obtain signatures from participants
2. Perform status check with group, answer any questions
3. Introduce elevated simulator rules, number of rappellers in simulator and in waiting
4. Introduce new hand signals and what they mean
5. Discuss rope control and how to accomplish it
6. Discuss stopping before the landing to assess landing area
7. Cover additional elevated simulator discussion topics with trainers prior to beginning Stage One of the elevated simulator training

### **D. Check Spotter**

1. Change blindness will be utilized at the discretion of the check spotter and be clearly communicated to all cadre and rappellers in the class.
2. Penalties will not be assessed until after one rappel is completed off of the elevated simulator.

### **E. Spotters**

1. Monitor rappellers' progress through elevated simulator training.
2. Coordinate with lead instructor on meeting objectives of training.
3. Monitor rappellers for fatigue and allow for breaks.

## **VI. Additional Elevated Simulator Points to Cover**

Ropes may stay deployed after first cycle.

Knots will only be considered knots when they are above the rope bag, prusik or weight.

## VII. Elevated Simulator – Stage One

- A. Rappellers perform buddy check
- B. Spotter checks the rappellers outside the simulator
- C. First rappellers to board simulator on each side perform visual and tactile check on equipment, move into seat, fasten rappeller tether to inboard side of the webbing bridge with release handle facing downward, and then fasten seatbelt.
- D. Last rappeller loaded performs spotter check and gives “Thumbs-up”
- E. Spotter checks rigging, taps inboard rappellers’ BD bags, and gets “Thumbs-up” signal
- F. Spotter checks rappeller tethers and seatbelts
- G. Spotter attaches spotter tether, takes seat, connects seatbelt
- H. Spotter presents attached carabiner to rappellers, rappellers confirm and exchange “Thumbs-up” signal.
- I. Outboard rappellers will secure rope bags.
- J. Spotter removes seatbelt and moves into position
- K. Spotter opens doors and deploys ropes
- L. Spotter gives rappeller “Remove Seatbelt” signal (one rappeller at a time)
  - 1. Rappeller:
    - a. Removes seatbelt and slides to edge of seat
    - b. Rigs descender
    - c. Rappeller inspects rigged descender, with outboard hand grasping free end of rope (rope going to ground) and inboard hand inspecting descender
      - i. Rope from anchor, enters at groove
      - ii. Carabiner captured
      - iii. Button out
      - iv. Rope exits at bobbin
      - v. **Handle locked**
    - d. Presents with outboard hand on the rope to the ground, and inboard hand on rappeller tether between harness and seatbelt ring (not release)
- M. Spotter tactilely inspects rigged descender and visually ensures the rappeller tether is attached.
  - 1. Rope from anchor, enters at groove
  - 2. Carabiner captured
  - 3. Button out
  - 4. Rope exits at bobbin
  - 5. **Handle locked**
  - 6. Rappel tether attached

N. Spotter gives “Move to Skid” signal (one rappeller at a time)

1. Rappeller
  - a. Moves from seat to skid
  - b. Squares up with rope on the right side of body
  - c. With left hand moves handle to primed position
  - d. Visually clears the rope to the ground
  - e. Places right hand on rappeller tether release
  - f. Performs visual self-check of rigged descender
  - g. Returns eyes to the spotter

O. Spotter gives “Begin Descent” signal

1. Rappeller
  - a. Releases rappeller tether
  - b. Begins transitioning off of skid looking at the anchor
  - c. Once on ground, rappeller manipulates cam with thumb to gain slack, opens cover, and removes rope to derig descender

## **VIII. Elevated Simulator – Stage Two**

A. Introduction of Knots

1. Review the “Knot-in-Rope” signal (finger pointing down the rope) and response (head nod).
  - a. Discuss the kinds of knots possible (loop, overhand, and tangles)
  - b. Have veteran rappeller demonstrate knot procedures
  - c. Lead instructor to brief demonstrators again on slowing down and being methodical
  - d. Discuss timeframes when working a knot
  - e. Brief on stopping above the problem and fixing the problem
2. During the first rappel with a knot, the spotter will signal to the rappeller that there is a knot in the rope before giving the “Remove Seatbelt” signal. After the rappeller’s first knot, it will be emphasized that the signal may come at any time during the rappel sequence.
3. The rappeller will acknowledge with the appropriate head nod response before progressing any further in the rappel sequence.
4. If the rappeller sees a knot when clearing the rope, it is their responsibility to signal to the spotter that there is a knot in the rope.
5. Instruct rappellers that the spotter may send the rappeller if they feel the problem is fixable.
6. Rappeller will remove two weighted knots. Additional weighted knots will be removed during Stage Four.
7. Rappeller will perform two error-free rappels with weighted knots in rope. Ground spotter ties knot in rope.

## **IX. Elevated Simulator – Stage Three**

### **A. Weighted Re-entries**

1. After rappeller completes a re-entry procedure, the doors will be shut and secured.
2. Rappeller will discuss any needed feedback with the spotter. Spotter will then remove the rope from the descender; rappeller will remove seatbelt and exit the simulator.
3. Simulation for the inside rappellers will continue as if the outside rappellers had rappelled to the ground. Repeat step two.
4. Rappeller will complete one weighted simulator re-entry from each side.
5. Rappellers can complete buddy checks on the elevated simulator and begin process of re-boarding for additional rappels.
6. Do not pull on handle or rappeller tether when re-entering the simulator.

## Lesson 8 - Emergency Procedures

### I. Objectives

- Identify and respond to emergency procedure hand signals from spotter
- Demonstrate ETO process without procedural error

### II. Responsibilities

#### A. Demonstrators

1. Perform demo ETO slowly, methodically and without error
2. Lead instructor shall narrate the process

#### B. Equipment Division

1. Set up as many suspension ETO stations as possible
2. Platforms for each station

#### C. Lead Instructor

1. Brief with demo rappeller(s) on expectations (slow, methodical, verbalize)
2. Brief rappellers on objectives of station and how ETO training will be conducted
3. Discuss reason for conducting an ETO
4. Introduce new hand signals: “Spread Eagle”, “Begin ETO”, “Lift-Out”, and “Clear to Fly Away”
5. Discuss possibility of being lowered to the ground, no signal
6. Discuss maintaining situational awareness
7. Discuss possible live scenarios that could happen

#### D. Check Spotter

1. Inform group that penalties will not be assessed during initial ETO training
2. Once group completes suspension ETO stage, penalties will be assessed
3. Penalties may be assessed for any non-ETO portions of the training
4. Change blindness will be utilized at the discretion of the check spotter and will be clearly communicated to all cadre and rappellers in the class

### **III. ETO Suspension Demonstration**

Lead trainer verbalizes the ETO process as demonstrated by veteran rappeller(s)

### **IV. ETO Suspension**

Following instruction and demonstration, rappellers shall perform ETOs from suspension

#### **A. ETO Suspension process**

1. Rappeller steps up onto platform and rigs descender
2. Spotter checks rappeller's descender
3. Rappeller steps off the box simulating they are stopped well above the problem
4. Rappeller pulls up problem and is unable to fix it
5. Rappeller places descender in locked position and gives the "Spread Eagle" signal
6. Spotter gives rappeller the "Begin ETO" signal
7. Rappeller initiates ETO process by routing rope through harness from right to left
8. Rappeller completes two half-hitches in a clockwise direction, going behind the rope and leaving a tail length of 6"-18"
9. Rappeller moves rope to left side of body
10. Rappeller simulates removing knife, cutting rope, and stowing knife
11. Rappeller gives "Lift-Out" signal and maintains situational awareness of surrounding obstacles
12. Rappeller gives "Clear to Fly Away" signal once well clear of surrounding obstacles
13. Rappeller places hands on half-hitches
14. Rappeller verbalizes looking for hazards, spotting landing, and simulates reaching the ground
15. End of simulation

#### **B. ETO Discussion - Rappeller/Spotter options**

1. Spotter cutting rope after rappeller reaches the ground
2. Rappeller untying half-hitches on the ground to clear the area
3. Rappeller waiting for slack and cutting the rope above the descender to clear the area

### **V. ETO Elevated Simulator Demonstration**

Lead trainer verbalizes the ETO process as demonstrated by veteran rappeller(s)



## **VI. Elevated Simulator - Stage Four**

### **A. ETO Elevated Simulator Process**

1. Rappeller stops well above the problem
2. Rappeller pulls up problem and is unable to fix it
3. Rappeller places descender in locked position and gives “Spread Eagle” signal
4. Spotter gives each rappeller their own “Begin ETO” signal
5. Rappeller initiates ETO process by routing rope through harness from right to left
6. Rappeller completes two half-hitches in a clockwise direction, going behind the rope and leaving a tail length of 6”-18”
7. Rappeller moves rope to left side of body
8. Rappeller simulates removing knife, cutting rope, and stowing knife
9. Rappeller gives “Lift-Out” signal and maintains situational awareness of surrounding obstacles
10. Rappeller gives “Clear to Fly Away” signal once well clear of surrounding obstacles
11. Rappeller places hands on half-hitches
12. Rappeller verbalizes looking for hazards, spotting landing, and simulates reaching the ground
13. End of simulation
14. Rappeller removes half-hitches and continues rappel

## **VII. Elevated Simulator – Stage Five**

### **A. Completion of Elevated Simulator**

1. Complete remaining 10 static-line rappels
2. Additional items such as random knots, typical terrain items (logs, tires, rocks, etc.), etc., should be used
3. Before end of elevated simulator, rappeller will practice cutting an unloaded rope held by an instructor

## Notes

## Lesson 9 - Helicopter Mock-Ups

### I. Objectives

- Rappeller will demonstrate rappel sequence and emergency procedures from a helicopter while on the ground until proficiency is demonstrated from all seating positions.

### II. Training Aids

Rappel configured Bell medium helicopter

### III. Minimum Requirements

- A minimum of 4 error-free mock-ups will be completed
- A minimum of 1 error-free cycle from each seat
- A minimum of 1 error-free re-entry from each side
- A successful re-entry will count as an error free cycle

### IV. Responsibilities

#### A. Equipment Division

1. Rig aircraft with rappel equipment

#### B. Lead Instructor

1. Cover expectations with rappellers (slow and methodical); emphasize that mock-up training is used to learn proper positioning, loading techniques, and in-flight responsibilities.

#### C. Check Spotter

1. Determine when to incorporate change blindness into mock-ups.
2. Utilize change blindness training from elevated simulator curriculum.
3. Misrigging of spotter gear is appropriate during mock-ups.
4. Coordinate with lead trainer as to when change blindness training will end.
5. Brief rappellers and spotters when change blindness training has stopped.

#### D. Spotters

1. Two trainers per aircraft; monitor rappellers for performance.
2. Coordinate with lead instructor regarding accomplishment of mock-up objectives.
3. Evaluate overall attentiveness and confidence of rappellers.

### V. Additional Mock-up Items

After a re-entry, a rappeller will derig their descender; the process ends at that point.

Full spotter PPE must be worn for the entire lesson.

There will be no change blindness on a rappeller's last cycle.

## Lesson 10 - Helicopter Rappels

### I. Objectives

- Demonstrate the ability to rappel from a hovering helicopter safely and efficiently
- When exposed to different rappel problems or terrain, the rappeller is able to complete the rappel or corrective procedure without procedural error or hesitation

### II. Training Aids

Rappel configured Bell medium helicopter

### III. Minimum Requirements

- Rappellers shall complete a minimum of eight live helicopter rappels without procedural error. The sequence and variation of these rappels are described below.

### IV. Responsibilities

Prior to helicopter rappels, rappellers must receive a briefing on emergency scenarios from the pilot and spotter; reference NROG, Chapter 6 – Rappel and Cargo Operations Emergency Procedures. Identify ground spotters, rappel sites, frequency utilization, transportation, and complete GAR risk assessment.

#### A. Equipment Division

1. Ensure manifests are complete and ropes are staged.
2. Have rappel reports ready for documentation.
3. Brief group on load assignments and equipment.
4. Ensure rope turners are ready to go with equipment and inspection logs.
5. Ensure veterans are available for gathering rappel equipment at each rappel site.

#### B. Lead Instructor

1. Brief group on live rappel operations and how they will be conducted.
2. Inform rappellers that there will be no intentional misrigging of equipment.
3. Ask if there are any questions.

#### C. Check Spotter

1. Review performance-based training, penalties are reset before going live.
2. If a rappeller receives a major during live rappels, their training will be discontinued for the rest of that season.

#### D. Spotters

1. Monitor rappellers' performance and correct deficiencies as needed.

#### E. Ground Observers

1. Assign a qualified spotter and at least one veteran rappeller to each rappel site.
2. The spotter must critique each rappeller.

## V. Live Rappel Sequence – Rappels 1 - 3

Before live operations, all rappellers shall receive an aircraft safety briefing.

The first rappels purposely start at a low altitude in flat, open terrain and progressively rise on each subsequent rappel for the purpose of allowing the rappeller to gain confidence. The following prescribed format for the first three rappels is recommended but may be adjusted as necessary to accommodate rappeller/environmental concerns or restraints.

### A. Rappels 1-2

1. 150 feet in flat, open terrain
2. 250 feet in flat, open terrain

Following the second rappel, shut down and debrief.

### B. Rappel 3 – ETO

Prior to commencing the ETO training rappel, the lead instructor shall brief on how the ETO rappel shall be accomplished:

1. Helicopter will set up at approximately 150 feet
2. Rappeller will rappel until approximately 20 feet from the ground, as marshalled by ground observers, and both rappellers should be roughly at the same elevation
3. Rappeller pulls up rope and simulates a knot that can't be undone
4. Rappeller places descender in locked position and gives the "Spread Eagle" signal
5. Spotter gives rappeller the "Begin ETO" signal
6. Rappeller initiates ETO process by routing rope through harness from right to left
7. Rappeller completes two half-hitches in a clockwise direction, going behind the rope and leaving a tail length of 6"-18"
8. Rappeller moves rope to left side of body
9. Rappeller simulates removing knife, cutting rope, and stowing knife
10. Rappeller gives "Lift-Out" signal and maintains situational awareness of surrounding obstacles
11. Rappeller gives "Clear to Fly Away" signal once well clear of surrounding obstacles
12. Rappeller places hands on half-hitches
13. The helicopter will lift rappellers a short distance then lower them to the ground
14. Rappellers shall then spot their landing, wait for slack, untie ETO, derig descender, and clear the area

Following ETO, shutdown and debrief

## VI. Live Rappel Sequence – Rappels 4-8

The final five training rappels shall occur in typical terrain. Before commencing these rappels, brief rappellers on the specific problems encountered in typical-terrain rappels. This briefing should occur in the field near the rappel site that will be utilized. Rappellers should be reminded at this time that they are a team with their rappel partner and should aid if their partner is struggling to clear from their ropes prior to landing or once they have reached the ground.

### A. Pre-Rappel Briefing

The pre-rappel briefing for the final five rappels should include the following typical terrain and timber items and points:

1. Typical terrain rappelling is very dynamic
2. Rappellers need to gather quick situational awareness pertaining to the rappel site when they check their rope and throughout the rappel
3. Speed control on the rope is critical
4. Slope is very deceiving. Rappellers should understand how to slow their descent and to check the slope, square up landing, position, and stabilize themselves to face uphill if possible, prior to derigging. Exit the site to a safe area visible to the spotter or pilot.
5. Timing – If rappellers find themselves swinging, learn to time the descent and swing to take advantage of open space below and to avoid impinging or tangling in timber.
6. Understand the type of timber at the rappel site. For example, Ponderosa pines are not very forgiving (i.e., not the type one can slide through well) whereas when in fir trees, a rappeller may be able to brush along the side of the branches and fight through it reasonably well.
7. It is critical that the rappeller constantly monitors the route of travel to the ground. The helicopter might drift around the spot leaving the rappeller to find themselves on the other side of the tree in short order. Again, this is when timing is an advantageous quality that must be identified and managed. Don't go past the point of no return!
8. Avoid pulling down on a rappeller's rope when assisting them to the ground. This may inadvertently allow rope to pass through the descender, causing the rappeller to descend with limited control.

### B. Additional Live Rappel Hand Signals

1. Bad Rope  
Given by rappeller to spotter to indicate there is something wrong with the rope and the spotter should drop it.
2. Discontinue Rappel  
Given by rappeller to spotter to indicate a bad rappel site and to discontinue the rappel.

C. Reconnaissance of Rappel Site(s)

A thorough recon of the rappel site is critical. The area shall be free of snags and known widow makers. The timber rappels should be in an open-enough site that the ropes do not travel through thick canopy.

D. Communications

It is critical that spotter and ground personnel have radio communication.

E. Rappels 4-8

4. 300 feet in tall open canopy
5. 150-300 feet in open canopy with sloped ground
6. 150-300 feet in open canopy where rappellers may encounter obstacles
7. 150-300 feet in more closed canopy where rappellers will likely encounter obstacles
8. 150-300 feet in more closed canopy where rappellers will likely encounter obstacles

## **Notes**