

## Rappeller Training



### Table of Contents

1 – Introduction / Program Overview .....	3
2 – Equipment Orientation, Issue, and Fit.....	6
3 – Buddy Checks.....	7
4 - Ground Training.....	10
5 - Suspension.....	12
6 – Elevated Platform (Low Tower) .....	13
7 – Elevated Platform Emergency Procedures .....	16
8 – Simulator (High Tower/Helicopter Simulator) .....	17
8 – Helicopter Mock-UP .....	21
9– Helicopter Rappels .....	22
10– Equipment Care and Inspection/Documentation .....	25

## **RESPONSIBILITIES**

**Check Spotters,** Ensure 100% proficiency is obtained by each trainee rappeller prior to moving them to next stage. Ensure performance based standards are being applied accordingly. Provide oversight and ensure proficiency to qualified and trainee rappel spotters.

**Lead Trainers,** you are accountable for the preparation of the unit you will be instructing. Items such as; A/V equipment, rigging, demo rappellers. It is important that you state your intentions to the demo rappellers. 100 % proficiency must be obtained by each rappeller you are instructing prior to moving them to the next stage.

**Spotters,** ensure standardization at all levels of training. See lead trainer.

**Spotter Trainee:** Continue at current trainee level stated in your spotter trainee handbook, and directed by the rappel check spotter group. Assist the lead instructor as assigned. Trainee spotter will not be allowed to spot live helicopter rappels for initial training.

**Demo Rappellers,** each demo rappeller shall receive a briefing from the lead trainer prior to demonstration. You are responsible for demonstrating important rappel procedures to students. If you are sloppy, students will learn sloppy.

**Squad Leaders,** you are accountable for tracking your rappellers' progression through all stations, communicating with lead instructors, and the wellness of your squad. Responsible for documentation for individuals assigned to your group.

**Equipment Division:** Overall command of equipment, Ensure adequate amount of personnel and equipment are available to support rappel operations for assigned group's.

**Equipment Inspections Lead:** Supervise rope inspectors to ensure all rappel equipment is appropriately inspected and logged prior to return to service. Ensure adequate number of ropes and genies are available to facilitate rappel operations for assigned group.

**Rappel Records Lead:** Ensure all rappels are properly documented, on a rappel report and file for later RapRec entry. Paper copies are required.

**Rope Inspectors:** Inspect, recover, and deliver rappel equipment as needed. Any inspection or equipment repair beyond your qualification or experience must be addressed by a qualified spotter before return to service. If you don't know ask a spotter.

**Pilots,** aircraft readiness, mission objective clear, de-conflict and manage your airspace.

<b>Lesson</b>	<b>1 – Introduction / Program Overview</b>	
<b>Objectives</b>	Obtain basic knowledge of Rappel Program Management Introduce Rappel candidates to performance based training.	
<b>Time Frame</b>	1 Hour	
<b>Training Aids</b>	Interagency Helicopter Rappel Guides, Optional PowerPoint Presentation	
<b>Lesson Outline</b>		<b>Key Points</b>
<p><b>1. Introduction</b>  <b>All available spotter, squadleaders, and specific rookie rappel group complete introductions</b>, JHAs, safety message, general housekeeping rules, cover squads, and the week’s objectives.</p> <p><b>2. History / Background</b></p> <p>a. Definition: Helicopter rappelling is the deployment of certified personnel from a hovering helicopter by means of an approved rope, a descent device, and ancillary equipment. Rappelling is comprised of a smooth, controlled descent to the ground.</p> <p>b. History</p> <p><b>3. Change Blindness</b>  The term ‘change blindness’ refers to the surprising 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 way of rigging the descent device and the current way rappel equipment should look for rappel operations. To reinforce the correct way, you will be introduced on how equipment can be miss-rigged. The intent is to teach you the correct way and to reinforce the correct by allowing you to see the incorrect. In summary allowing your mind to see both the correct and incorrect helps condition your mind for noticing changes that could go unnoticed.</p> <p><b>4. Performance Based Training:</b>  <u><b>Initial Rappel Training</b></u>  Rappel candidates must receive a passing grade for each station as determined by the Evaluating Spotter. The criterion for each station is listed in this Training Aid. Failure to pass any station will lead to removal from the training.</p> <p><u><b>Classroom Training (Equipment Orientation/Buddy Check)</b></u>  Pass/Fail to be determined by the Evaluating Spotter. The candidate must meet the objectives in this Rappel Training Syllabus prior to moving on to ground training.</p> <p><u><b>Ground Training</b></u>  Pass/Fail to be determined by the Evaluating Spotter. The candidate must meet the objectives in this Rappel Training Syllabus prior to moving on to tower training.</p>		<p>Reference Introduction powerpoint.</p>

**Tower Training (low/high simulator/mock-up)**

A system of penalties (see errors) is incorporated into rappel training starting at Tower Training. During the initial tower training, penalties will not be applied until the candidate has completed five tower rappels. Evaluating Spotters will determine what action is required. Three minor penalties constitute one major. Three majors will be grounds for a candidate's immediate removal from training. After three majors the candidate's immediate removal from training will be recommended by the Lead Instructor, approved by the Check Spotter and the candidate's supervisor is informed.

**Helicopter Training**

During live rappels, one major or three minors (regardless of previous penalties) will be grounds for a candidate's immediate removal from training. Evaluating Spotters will not allow candidate to continue. The candidate's removal will be approved by the Check Spotter and the candidate's supervisor is informed.

5. **Errors which invoke penalties:**

**Note: The errors listed below are only a list of examples and 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.**

**Errors are broken into two classifications:**

- a. **Majors** – mistakes made by the rappeller candidate that, if left uncorrected could cause serious injury or death to the rappeller or put the aircraft and crew at serious risk. These include:
  - i. **Buddy Check**
    1. Harness: leg strap unbuckled or buckled incorrectly (outside leg)
    2. Tri link not capturing both soft loops, barrel nut loose or
    3. Snap hook improperly rigged
    4. Missing knife
  - ii. **Failure to hook-up**
  - iii. **Moving without spotters signal**
  - iv. **Severe landing (injury or fall to backside)**
  - v. **Continual descent problems**
    1. Excessive speed
    2. On-rope situational awareness (knots)
  - vi. **Continual emergency procedure problems**
    1. Indecisiveness or failure to complete process
    2. Incorrect Tie-off

<ul style="list-style-type: none"> <li>vii. <b>Inadequate rappel site situational awareness</b> <ul style="list-style-type: none"> <li>1. Rappelling past a problem (limb-over, missing the hole, etc.)</li> <li>2. Slope and obstacle assessment</li> </ul> </li>   <li>b. <b>Minors – Mistakes made by the rappeller candidate which, if left uncorrected could jeopardize or delay the rappel procedure and or damage equipment or PPE. These include:</b> <ul style="list-style-type: none"> <li>i. <b>Buddy Check</b> <ul style="list-style-type: none"> <li>1. PPE missing, in poor condition or incorrectly worn (includes hair not tucked, nomex, harness poorly adjusted, leg strap buckled backwards)</li> <li>2. BD Bag incorrectly worn (compression strap outside handle, clicklock ears not out, zipper not closed)</li> </ul> </li> <li>ii. <b>Continual equipment inspection deficiencies</b> <ul style="list-style-type: none"> <li>1. Rappel rigging</li> <li>2. Spotter Check</li> </ul> </li> <li>iii. <b>Continual miss-rigging of rappel equipment</b> <ul style="list-style-type: none"> <li>1. Gunner strap</li> <li>2. Seatbelt</li> <li>3. Descent device</li> </ul> </li> <li>iv. <b>Inappropriate or lack of response to spotters hand signal</b></li> <li>v. <b>Continual exit problems (from exit seat to exit skid)</b></li> <li>vi. <b>Locking-off problems</b></li> <li>vii. <b>Continual landing problems (stutter stop, knee, step out)</b></li> <li>viii. <b>Improper treatment of rappel equipment</b> <ul style="list-style-type: none"> <li>1. Dropping genie</li> <li>2. Stepping on rope</li> <li>3. Not properly stowing personal rappel equipment</li> </ul> </li> <li>ix. <b>Procedures out of order</b> <ul style="list-style-type: none"> <li>1. Locking off prior to hooking up</li> <li>2. Trying to move skid prior to releasing gunner strap</li> </ul> </li> </ul> </li> </ul>	
---	--

<b>Lesson</b>	<b>2 – Equipment Orientation, Issue, and Fit</b>	
<b>Objectives</b>	1) Demonstrate proper use, care, of equipment 2) Development of equipment confidence.	
<b>Time Frame</b>	Performance Based	
<b>Training Aids</b>	Interagency Helicopter Rappel Guide available to students. All articles of rappel equipment. Optional PowerPoint Presentation.	
<b>Lesson Outline</b>		<b>Key Points</b>
<p><b>1. Rappel Equipment Introduction</b></p> <ul style="list-style-type: none"> <li>a. <b>All equipment will be monitored, and life expectancy will be followed in order to maintain an adequate margin of safety.</b></li> <li>b. <b>Equipment approval process is identified in Chapter 3 of the IHRG</b></li> <li>c. <b>Any questions or concerns as to the condition or safety of equipment shall be directed to a Spotter.</b></li> </ul> <p><b>2. Equipment Orientation</b></p> <ul style="list-style-type: none"> <li>a. <b>Helmet</b></li> <li>b. <b>Eye Protection</b></li> <li>c. <b>Fire Resistant Clothing</b></li> <li>d. <b>Agency Approved Boots</b></li> <li>e. <b>Rappel Gloves</b></li> <li>f. <b>BD Bag</b></li> <li>g. <b>Rappel and Spotter Harness</b></li> <li>h. <b>Knife</b></li> <li>i. <b>Descent Device</b></li> <li>j. <b>Rope</b></li> <li>k. <b>Carabiners</b></li> <li>l. <b>Snub Straps</b></li> <li>m. <b>Gunner Straps</b></li> </ul> <p><b>3. Aircraft Equipment</b></p> <p><b>Note: Pilot may assist with this section.</b></p> <ul style="list-style-type: none"> <li>a. <b>Rappel Anchor – Helicopter Specific</b> <ul style="list-style-type: none"> <li>i. <b>Contractor – Built/Certified/Installed</b></li> <li>ii. <b>Inspected by the Agency</b></li> </ul> </li> <li>b. <b>Spotter Attachment Point</b> <ul style="list-style-type: none"> <li>i. <b>Model Specific</b></li> </ul> </li> </ul>		<p>Ref. Equipment powerpoint.</p> <p>See IHRG, Chapter 3.3.2 for particular details on rope care.</p> <p>Refer to San Dimas Equipment Development Center (SDEDC) Technical Bulletin on Ropes 5/25/90 and Aviation Technical Tip 06/92</p>



1. Shirt tucked in collar up, buttoned to the top, flight suit fully zipped. Pockets with Velcro or buttons empty, pockets with zippers zipped
2. Sleeves - (no holes, clean & tight at wrist)

**C RAPPEL GLOVES**

1. **Fastened & in good condition with no loose ends, pitch or contaminants**
2. **Stitching and Padding with no holes (palms, between fingers, flap, thumb/forefinger gusset)**

**D HARNESSES**

1. Risers –
  - **snuggly fitted**
  - webbing and visible stitching in good condition
  - no twists
  - buckles secured with no visual defects
2. Lat Straps -
  - **snuggly fitted**
  - webbing & stitching in good condition
  - no twists
  - plastic or nylon keepers in place
3. Soft Loops - webbing & stitching in good condition
4. Both Soft Loops **CAPTURED INTO** Tri-link
5. Rubber Gasket captures Tri-Link & harnesses right side Soft Loop & is in good condition
6. **Tri-link is locked, barrel down & tight to Rappellers left, and physically try to loosen.**
7. **Snap hook is CAPTURED IN Tri-link**
8. **Snap hook locked, Snap hook opens, Snap hook locks again**
9. Visually check snap hook detent pin, no obvious gap and the center shaft is peened
10. **PULL ENTIRE SNAP HOOK/TRI-LINK/SOFT LOOP ASSEMBLY – (LOOK, SEE & FEEL-METAL INTO METAL)**

**E BD Bag**

1. **Click locks secured**, horns out
2. Top straps through handle, buckles secured
3. Side straps tight
4. Zippers on left side of BD Bag with pull tab stowed under cover.
5. Double tap on BD bag to indicate rappeller to lift bag
6. Bottom of BD Bag in good condition

**F Leg Straps**

1. Buckles attached, no fabric caught
2. Webbing & stitching in good condition
3. No twists, snug fit, loose ends secured

**G Raptor Knife**

1. **Secured in sheath on Rappellers left, both snaps secured.**
2. **Lanyard stowed, horn facing aft**

**H NOMEX & BOOTS**

1. Nomex pants/flight suit in good condition,
  - Velcro in good condition and no hooks showing
  - Velcro or button pockets empty, pockets with zippers zipped
2. Waist belts clear of cases or pouches etc.
3. Pant cuffs over approved laced leather boots

**I Single tap on BD bag to inductate rappeller to turn around****J RAPPELLER'S BACK SIDE**

1. Helmet in good condition
2. Hair tucked into Nomex shirt, flight suit, or helmet
3. Avionics cord tucked in if necessary, collar up & no loose ends
4. Harness –
  - webbing & visible stitching in good condition
  - no twists
  - Buckles & loose ends secured
5. Nomex shirt & pants –
  - Velcro in good condition and no hooks showing
  - waist belts clear of cases or pouches
  - Velcro or button pockets empty
  - pockets with zippers zipped
  - Pant cuffs over approved leather boots with no accessories attached to boots.

**K EXCHANGE THUMBS UP - "I AGREE, I AM O.K."****Rope/descent device inspection (As Appropriate for type aircraft training****Exchange thumbs UP – "I agree, I am OK"****5. Field Practical**

- a. Instructor (and assistants) will now start individual trainee instruction on procedures.
- b. Trainee rappellers follow the same sequence just demonstrated.

<b>Lesson</b>	<b>4 - Ground Training</b>	
<b>Objectives</b>	1) Demonstrate confidence and proficiency in equipment use. 2) Demonstrate basic relationship between rappel equipment. 3) Develop individual proficiency in handling the descent device, rope, and lock-off procedures. 4) Demonstrate braking techniques and loss of rope control procedures.	
<b>Time Frame</b>	Performance Based	
<b>Training Aids</b>	Training ropes attached to immovable object, suitable open area, personal rappel gear, descent control device.	
<b>Lesson Outline</b>		<b>Key Points</b>
1. <b>Set Up/Responsibilities :</b> <ol style="list-style-type: none"> <li>a. <b>Equipment Division:</b> Set up ropes, make sure 1 descent device exist per trainee,</li> <li>b. <b>Lead Instructor:</b> Demonstrate how to rig the descent device, inspect, attach/detach and rappel following the curriculum below. During your briefing cover verbalization, mechanics of braking, thumb position on rope, looking down the rope, don't step on rope. As appropriate regaining of loss of rope control. <b>Do not cover, knots or hand signals.</b></li> <li>c. <b>Check Spotter:</b> Over see training for standardization and proficiency of trainees. During stage three of training, incorporate change blindness training to individual squads as appropriate. Show them how genies can be miss-rigged end training with correctly rigged descent device.</li> </ol> 2. <b>Equipment Operations Demonstration</b> <ol style="list-style-type: none"> <li>a. <b>Rigging the Decent Device</b> <ol style="list-style-type: none"> <li>i. Descent Device in Left Hand</li> <li>ii. Orient the Descent Device</li> <li>iii. Thumbscrew on the right</li> <li>iv. Loosen thumbscrew, push detent pin in</li> <li>v. Remove cover, stow cover</li> <li>vi. Rope in the front, 2 ½ wraps to the right, out the back</li> <li>vii. Replace Cover</li> <li>viii. Detent pin out</li> <li>ix. Thumbscrew tight</li> </ol> </li> <li>b. <b>Inspection</b> <ol style="list-style-type: none"> <li>i. In the front, out the back, 2 in the window to the right</li> <li>ii. Detent pin out, thumbscrew tight</li> <li>iii. Display</li> </ol> </li> <li>c. <b>Attach/Detach</b></li> </ol>		Instructor should rig rope with it on right side of body.



<b>Lesson</b>	<b>5 - Suspension</b>	
<b>Objectives</b>	1) To ensure correct harness fit 2) Familiarize rappeller with equipment while weighted	
<b>Time Frame</b>	Performance Based	
<b>Training Aids</b>	Ropes attached to hanging device (pull up bars, lower tower), personal rappel gear, full PPE and BD Bag, descent control device.	
<b>Lesson Outline</b>		<b>Key Points</b>
<p><b>Set Up/Responsibilities</b> : No hand signals, no spotter check required of the rappeller. Full PPE is required of trainees from this point on.</p> <p><b>Equipment Division:</b> Set up ropes, make sure 1 descent device exist per station. Have stools available for rappellers to step up on. One per station.</p> <p><b>Lead Instructor:</b> Brief on intent of station, inform rappellers on how the station will be conducted. All PPE is required from here on. Follow outline below. Demo the suspension process.</p> <p>Do not cover: Hand signals, descending, landings or squatting to get off rope.</p> <p><b>Spotters:</b> Rig descent device, inspect device, no spotter check is required of the rappeller. Inform rappeller where and if adjustments are need to rappel harness</p> <p><b>Suspension Curriculum</b></p> <p><b>Rappellers perform buddy checks</b></p> <ul style="list-style-type: none"> <li>Spotter gives rigged descent device to rappeller</li> <li>Rappeller steps up on platform.</li> <li>Rappeller hooks up and locks off (verbalize)</li> <li>Rappeller moves into hanging position-harness adjustment if necessary</li> <li>When suspension is complete rappeller unlock descend as necessary unhook.</li> <li>If adjustments are need have rappeller repeat suspension stage.</li> </ul>		

<b>Lesson</b>	<b>6 – Elevated Platform (Low Tower)</b>	
<b>Objectives</b>	1) Recognize proper hand signals 2) Familiarize rappeller with fit and function of equipment 3) Recognize model specific rappel equipment. 4) Demonstrate hook-up and lock-off. 5) Demonstrate controlled descent. 6) Demonstrate proper braking techniques. 7) Demonstrate proper landing. 8) Demonstrate confidence and proficiency with equipment and procedures.	
<b>Time Frame</b>	Performance Based	
<b>Training Aids</b>	Training ropes, Low Tower Platform, Harnesses, two (2) instructors/spotters, JHA and Tower Safety Plan.	
<b>Lesson Outline</b>		<b>Key Points</b>
1. <b>Training Aids:</b> Training ropes, low tower platform, Full PPE and BD bag, JHA, gunner straps, objectives posted. 2. <b>Set Up/Responsibilities :</b> Two veteran rappellers for demonstration purposes. Spotter check can be performed by qualified spotter prior to rappeller going to low tower station. 3. <b>Equipment Division:</b> Setup lower tower stations (ropes, snub straps) make sure gunner straps are in place one per station. Spotter tether attachments in place. Complete tower inspection if not already done, post objectives board. Issue one descent device to each rappeller trainee. 4. <b>Lead Instructor:</b> Cover expectations with demo rappellers (slow methodical verbalize), cover tower JHA, cover objectives of low tower, Introduce “Move to Skid, and “Begin Decent signal. Introduce gunner strap, orientation, and hand placement. Review loss of rope control procedure. Introduce feeding the genie down the rope after un-hooking. Brief on buddy check, performed on the ground before coming up tower. During demo verbalize what is happening, monitor group for questions. Cover low tower rules, number of rappellers in waiting station. 5. <b>Check Spotter:</b> Review performance based training and when penalties will be assessed with spotters and squad leaders assigned to group. Do this prior to low tower training. Review performance based training with rappellers, brief them on when penalties will be assessed. Determine when to introduce handing descent device backward to rappellers with lead instructor do not incorporate until after the third cycle. Monitor training for standardization and objectives being meet. 6. <b>Spotters:</b> Rig descent device, spotter check rappeller, verbalize hand signals. Monitor rappeller performance make corrections as needed. Coordinate with squad bosses on penalty assessments. Belay rappellers for initial cycles of tower rappels.		Suggested feeding the genie about 10 feet.

<p><b><u>Lower Tower Instructions-Briefed by Lead Instructor</u></b></p> <p><b><u>Exit to Rappel ready</u></b>          Confidence in equipment          Rotation out          Rope to right side          Rappeller checks rope below          Ready position—right hand ready to unlock, left hand on the descent device, eyes on the spotter.</p> <p>-</p> <p><b><u>Rappel</u></b>          Unlock begin rappel          Descent control (braking, stopping)          Looking down the rope          Hand Placement          Loss of rope control          Double brake (demo rappeller)</p> <p><b><u>Landings.</u></b>          Square up          Quick stop prior to landing          Plant both feet firmly on ground, assume squat position while utilizing braking hand to feed into descent device to gain slack in rope. (Emphasize no knee touching the ground)</p> <p><b><u>Low Tower Process</u></b></p> <ul style="list-style-type: none"> <li>• Rappellers perform buddy checks (on the ground)</li> <li>• Spotter rigs descent device, inspects rigging,</li> <li>• Spotter completes check of rappeller( this may be completed by a qualified spotter prior to rappeller entering station)</li> <li>• Rappeller hooks up gunner strap (type II platform). Snap on the right.</li> <li>• Spotter hands descent device to rappeller</li> <li>• Rappeller orients, hooks up, locks off Descent device and presents to spotter with left hand on descent device, right hand on gunner strap snap. (verbalize)</li> <li>• Spotter checks rigging and gives “Move to skids” signal (<i>remove gunner strap and move into pre-rappel position, suspended hanging, with no feet on the tower</i>).</li> <li>• Rope on right side.</li> <li>• Rappeller in ready position</li> <li>• Spotter gives “Begin Descent” signal (downward sweep of hand)</li> <li>• Rappeller unlocks, descends, brakes and lands (verbalize)</li> <li>• Rappeller unhooks from descent device.</li> <li>• Ground spotter removes descent device from rope.</li> </ul>	<p><b>Platform spotter and ground safety spotter will be assigned for each rope in use.</b></p> <p>Stress that at least one hand must be kept in a braking position while descending.</p> <p>Emphasize looking down rope.</p> <p>Remember continual and repetitive training in these procedures is recommended to reach levels of confidence and proficiency. Spotters will emphasize “buddy checks” and hand signals.</p> <p>Ensure all exits are tracked on Initial Rappeller Task Sheet.</p>
---	---

<p><b><u>Review of Double Braking/Loss of Rope Control (Lead Instructor)</u></b></p> <p>At this time review double braking. Once committed to the double brake stay there until after the quick stop. Go underneath with left hand to double brake not over. Review loss of rope control, but do not demonstrate.</p> <p>Prior to the introduction of knots all rappellers will perform mid rappel lock off. This will be coordinated by lead instructor and verbalized to the group. Spotters will inform rappellers when to perform mid rappel lock off.</p> <p>Break Low Tower operations for Knots overview.</p> <p><b><u>Introduction of Knots.</u></b></p> <p><b><u>Lead Instructor:</u></b> Introduce the knot in the rope signal (Finger pointing down the rope). Talk about the kinds of knots possible (loops, overhand, tangles, have veterans demonstrate knots. Lead instructor to brief demonstrators again on slowing down and being methodical. Discuss timeframes when working a knot. Brief on stopping above your problem. Then fixing the problem.</p> <p>Instruct rappellers at this time if either the spotter or rappeller see a problem in the rope, they need to signal the other by pointing down the rope. The spotter will acknowledge the problem and may send the rappeller if they feel the problem is fixable.</p> <p>Same sequence as above, ground spotter ties knot in rope.</p> <p>At this station spotter will signal the knot to the rappeller (prior to going into suspension), the rappeller will acknowledge before exiting the platform (head nod)</p>	<p>Remember that we will attain 100% proficiency before moving on to next section.</p>
--	--

<b>Lesson</b>	<b>7 – Elevated Platform Emergency Procedures</b>	
<b>Objectives</b>	1) Identify and respond to Emergency Procedure hand signals from spotter. 2) Demonstrate rappeller emergency procedures without error.	
<b>Time Frame</b>	Performance Based	
<b>Training Aids</b>	Training ropes, personal rappel gear, and descent control device, pilot may be present.	
<b>Lesson Outline</b>		<b>Key Points</b>
<p><b>Equipment Division:</b> Set up as many ETO stations as possible, make sure platforms exist for each station.</p> <p><b>Lead Instructor:</b> Brief with demo rappeller on expectations (slow, methodical, verbalize), brief rappellers on objectives of stations and how the ETO training will be conducted. Discuss reason for conducting an ETO, introduce spread eagle signal, maintain rope control. Discuss possibility of being lowered to the ground, no signal, maintain situation awareness (SA). Verbalize the ETO process as demonstrated by veteran rappeller.</p> <ul style="list-style-type: none"> <li>• Routing of rope through harness</li> <li>• Length of rope needed to complete ETO process</li> <li>• Half hitches completed in clockwise direction, going behind the rope</li> <li>• Length of tail</li> <li>• Move rope to left side of body</li> <li>• Remove knife, simulated cutting rope, stowing knife</li> <li>• Rappeller gives “lift out” signal maintaining SA</li> <li>• Rappeller gives “clear to fly away signal”, hands on genie.</li> <li>• Once on the ground wait for slack then cut the rope above the half hitch.</li> </ul> <p><b>Check Spotter:</b> Inform group that penalties will not be assessed during beginning ETO training, once group moves to ETO off the high tower penalties may be assessed. Penalties may be assessed for any non ETO portions of the training</p> <p><b>Spotter:</b> Rig descent device and check rigging, follow ETO process listed below..</p> <p><b><u>ETO Process</u></b></p> <ol style="list-style-type: none"> <li>1. Spotter rigs descent device on rope, and checks.</li> <li>2. Spotter checks rappellers’ rigging</li> <li>3. Rappeller step up onto platform</li> <li>4. Spotter hands descent device to rappeller</li> <li>5. Rappeller orients descent device, hooks up and locks off</li> <li>6. Rappeller steps off the box.</li> <li>7. Spotter gives “Begin Descent” signal.</li> <li>8. Rappeller unlocks, move to proper hand placement, locks off</li> <li>9. Rappeller simulates knot, can’t untie knot goes to spread eagle.</li> <li>10. Spotter gives ETO hand signal.</li> </ol> <p style="text-align: center;"><b>Rappeller performs ETO, with simulated rope cut.</b></p>	<p>Remember risks exist and consequences are potentially <b>FATAL!</b> Everyone must understand this concept.</p> <p>Ref: IHRG Chapter 6.1 Rappeller procedures and signals.</p> <p>Re-iterate stopping well above the problem.</p> <p>Ensure a proper length of looped tail is (6” – 12”) is left after half hitches are complete.</p> <p>It is recommended the first revolution be done near ground level to ensure proper instruction during the ETO sequence.</p> <p>Practice cutting unloaded retired ropes.</p>	

<b>Lesson</b>	<b>8 – Simulator (High Tower/Helicopter Simulator)</b>	
<b>Objectives</b>	<ol style="list-style-type: none"> <li>1) Identify and demonstrate proper model specific seating configuration.</li> <li>2) Demonstrate inspection of simulator rappel equipment (Model Specific)</li> <li>3) Demonstrate spotter equipment check without error.</li> <li>4) Identify and respond to spotter hand signals.</li> <li>5) Demonstrate proficiency in exit from simulator.</li> <li>6) Perform three minimum requirements for tower training listed below.</li> </ol>	
<b>Time Frame</b>	Performance Based	
<b>Training Aids</b>	Training rope, high tower platform (minimum 20') with simulator, fully equipped rappeller/trainees, two (2) instructors/spotter, and two (2) ground safety spotters, JHA and tower safety plan.	
<b>Lesson Outline</b>		<b>Key Points</b>
<ol style="list-style-type: none"> <li>1. <b>Minimum Requirements</b> During tower training (Lessons 6-8) each trainee will perform cumulatively a total of 20 static line rappels. The trainee must also complete the Rappeller Performance Based Requirements outline in 2.4.3 of this guide. These may be included in the rappels required above.</li> <li>2. <b>Set Up/Responsibilities</b> : Veteran rappellers for demonstration purposes. Lead spotter narrates high tower procedures while one spotter performs the procedures. Have group gather around high station demo.</li> <li>3. <b>Equipment Division</b>: Setup high tower simulators with ropes, snub straps, carabiners, seatbelts, gunner straps, spotter tether attachments. Unlock simulator doors if applicable.</li> <li>4. <b>Lead Instructor</b>: Perform status check with group, questions? Introduce high tower rules, number in simulator number in waiting. Introduce new hand signals and what they mean. Brief on each rappeller gets there own signal, no movement without a signal. Cover first rappeller equipment check, and last rappeller spotter check. Discuss rope control and way to do this. Introduce additional hand signals in stage two. Cover additional high tower discussion topics with trainers prior to begin stage one high tower training.</li> <li>5. <b>Check Spotter</b>: Discuss how change blindness training will be conducted on high tower. Coordinate with lead instructor on when to begin incorporating change blindness training. Determine when to add rope weight for training. Brief spotters on the additional high tower teaching points outlined on next page.</li> <li>6. <b>Spotters</b>: Monitor trainees progress through high tower training. Coordinate with lead instructor on meeting objectives of training. Monitor trainees for breaks and fatigue.</li> </ol>		

7. **High Tower Signals Introduction: Stage One**

- a. **Thumbs up signal:** Used by rappellers and spotter to indicate, “I agree”, or “ I am Ok.” Exchanged between rappeller and spotter during boarding sequence, and equipment inspections.
- b. **Knee Tap:** Used by spotter to acknowledge that inboard rappellers have check rappel rigging. Spotter taps inboard rappellers and point to anchor, rappellers give thumbs up if rigging has been checked.
- c. **Remove Seatbelt:** Given by spotter to each rappeller. Undo seatbelt, orient, hookup, and lock off Descent Device, present to spotter with left hand on device, right hand on gunner strap.
- d. **Move into Position:** Review this signal, given by spotter to rappeller to signal move into pre-rappel position. Rappellers move from seat out the door to skid. Rappellers clear rope to right side, square up on skid, inspect rope and harness interface, move hand into ready position, eyes on spotter, knot signal as appropriate.
- e. **Begin Descent:** Review hand signal

Be sure and give continued verbal description and instruction of what is occurring in the demonstration.

8. **Additional High Tower Points to Cover (Lead Instructor)**

- a. Trainees do not need to buckle seatbelt behind them
- b. Utilize knee tap and point to anchor, do not use sweeping motion of hand.
- c. Ropes may stay deployed after first two cycles per squad.
- d. Students will have a rope tender on belay until student show ability to control descent.
- e. Knots will only be considered knots when they are above the rope bag.

9. **Change Blindness Training: Check Spotter Responsibility**

Two spotters will be knowledgeable of the miss-rigging or rappel equipment. spotters who miss-rigged equipment will monitor situation for when error should have been identified. If error is identified, error will be corrected then and rechecked by spotter and trainee. If a spotter starts a simulator cycle with miss-rigged equipment, they will finish the cycle before changing spotters. No change blindness training will be conducted without check spotter approval:

- At the discretion of the check spotter a spotter on the ground will start introducing errors in rappellers equipment to be caught during buddy checks. The rappeller whose equipment has been miss-rigged must have knowledge of the miss-rigging. Trainer will not allow rappellers to continue to the tower until the error has been identified and corrected by the rappeller(s)
- Any alterations to the harness connecting hardware must follow the inspection guidelines found in the IHRG chapter 3.
- At the discretion of the check spotters, spotter will introduce errors

<p>in the rigging and equipment for the rappellers to detect during the equipment checks. Errors may be introduced in any of the rigging but should be focused in the descent devices, snub straps, and carabineers.</p> <ul style="list-style-type: none"> <li>• <b>For spotter safety no intentional miss-rigging of spotter equipment or attachment hardware will be used on the tower.</b></li> <li>• At the discretion of the check spotter, spotters will start to give incorrect hand signals</li> </ul> <p style="text-align: center;"><b><u>High Tower Process</u></b></p> <p><b>10. Stage 1</b></p> <ol style="list-style-type: none"> <li>Rappellers perform buddy check</li> <li>Spotter checks the rappellers outside the aircraft (thumbs up).</li> <li>1<sup>st</sup> Rappellers each side loaded performs visual and tactile check on equipment, move into seat, fastens gunner strap, then seat belt. Based on tower design outboard rappeller will secure rope bag.</li> <li>Last rappeller loaded performs spotter check and gives thumbs up (Rappeller to verbalize what is being checked on spotter)</li> <li>Spotter checks rigging, knee taps inboard rappeller and gets thumbs up</li> <li>Spotter checks rappellers in simulator, gunner straps, and seatbelts.</li> <li>Spotter attaches spotter tether takes seat, connects seat belt.</li> <li>Spotter presents to Rappellers, exchange thumbs up</li> <li>Spotter removes and secures seat belt, and moves into position.</li> <li>Spotter opens doors and deploys ropes.</li> <li>First rappel is straight forward (spotter and squad leaders)</li> <li>Spotter gives rappellers remove seat belt signal (one rappeller at a time)</li> <li>Rappellers undo seat belts adjust and orient descent device, hook-up descent device, lock-off and presents.</li> <li>Spotters gives “move to skid” signal</li> <li>Rappellers undo gunner strap, move to skid and clear rope, check rigging interface.</li> <li>Spotter gives “begin descent” signal.</li> <li>Rappellers unlock, rappel, brake, and land.</li> </ol>	<p>Trainees suited in full rappel gear (Nomex, harness, BD, knife, helmet, gloves, and descent device.)</p> <p>Instruct rappellers, if the rubber gasket breaks after the buddycheck, they may continue the process</p> <p><b>Note: Emphasize rope bag control while in flight.</b></p> <p>Emphasize to trainees to pull decent device tight when presenting to spotter.</p> <p>Rappellers will need to ensure descent device does not crossload during this process.</p>
---	---

<p>11. <b>Stage 2</b>  <b>Brief new material continue high tower training as outlined above</b></p> <p><b>Lead Instructor:</b> Introduce hand signals for stage two training.</p> <ul style="list-style-type: none"> <li>a. <b>Stop Hold Position:</b> Signal given by spotter to stop and hold rappeller in position prior to the “begin descent” signal:</li> <li>b. <b>Return to Seat:</b> Given by spotter to indicate rappellers should return to seat and buckle seat belt: May be a de-rig or rope cut scenario.</li> <li>c. <b>Bad Rope:</b> Given by rappeller to spotter to indicate there is something wrong with the rope and spotter should drop it.</li> <li>d. <b>Discontinue Rappel:</b> Given by rappeller to spotter to indicate bad rappel site, discontinue rappel.</li> </ul> <p>12. <b>ETO’s:</b> Elaborate on ETO’s and time frames for working on problems. Repeat may not get signal to proceed with ETO after spread eagle.</p> <ul style="list-style-type: none"> <li>➤ As trainees complete ETO training, have students cut a piece of rappel rope after completing ETO. This will be coordinated by Lead Trainer.</li> </ul> <p>13. After student completes re-entry procedure, the spotter will confirm that the student is locked off, verbally instruct the student to remove seatbelt and simulate gunner strap. Rappel sequence will be reinitiated at this point.</p> <p>14. As rappellers become proficient, additional items such as random knots, typical terrain items (logs, rocks, etc.), tension on rope (so rappeller needs to use both hands to free rope to continue decent), etc. should be used</p> <p><b>Break and debrief “Are they ready for mock-ups?”</b></p>	<p>Note: Spotter will demonstrate de-rigging of equipment during mock ups.</p>
---	--

<b>Lesson</b>	<b>8 – Helicopter Mock-UP</b>	
<b>Objectives</b>	1) Identify model specific helicopter configuration. 2) Demonstrate model specific rappel procedures from helicopter on the ground without error or hesitation.	
<b>Time Frame</b>	Performance Based	
<b>Training Aids</b>	Rappel equipped helicopter, fully equipped spotter and rappellers/trainees.	
<b>Lesson Outline</b>		<b>Key Points</b>
<ol style="list-style-type: none"> <li>1. <b>Minimum Requirements.</b> Trainee will demonstrate a rappel sequence and emergency procedures until proficiency is demonstrated from all seating positions.</li> <li>2. <b>Set Up/Responsibilities :</b> Prior to beginning mockups all rappellers need aircraft safety briefing,. Full load of veteran rappellers for demonstration purposes.</li> <li>3. <b>Equipment Division:</b> Rig aircraft with rappel equipment to include cargo.</li> <li>4. <b>Lead Instructor:</b> Cover expectations with demo rappellers (slow methodical verbalize), emphasis mockup training is to learn proper positioning, loading techniques, in-flight responsibilities. Narrate demo as spotter performs operation. Let trainee’s know that trainee’s will demonstrate rappel and emergency sequences until proficiency has been established from all seating positions.</li> <li>5. <b>Check Spotter:</b> Determine when to incorporate change blindness into mock-ups. Utilize change blindness training from high tower curriculum. Miss rigging of spotter gear is appropriate during mock-ups. Coordinate with lead trainer as to when change blindness training will end. Brief trainees and spotters when change blindness training has stopped. Make sure spotters are showing the different possible scenarios after re-entries to trainees.</li> <li>6. <b>Spotters:</b> Two trainers per aircraft, monitor trainees for performance. Coordinate with lead instructor as to mockup objectives being met. Evaluate overall attentiveness and confidence of rappellers.</li> <li>7. <b>Additional Mock-up Items:</b> <ol style="list-style-type: none"> <li>a. After a re-entry rappeller unlocks and unhooks from descent device, process ends there.</li> <li>b. During mockups’ perform de-rigging of descent device after re-entry and simulated rope cutting</li> <li>c. Full spotter PPE must be worn for at least 2 cycles per group.</li> <li>d. Trainers / spotters will not introduce or utilize rigging and or equipment errors on the last mock- up cycle.</li> <li>e. Pilots are required to participate in mock-up training prior to live rappels.</li> </ol> </li> </ol> <p><b>Spotter that completes last mock-up cycle will spot first live rappel with trainees.</b></p>		<p>Pilot may be present in helicopter. This to acquaint the pilot with the rappel sequence and get the group working as a team.</p> <p>Trainees must be fully suited up and equipped during mock-up training.</p> <p>This is the real thing without being airborne.</p> <p>Remember that we will attain 100% proficiency before moving on to the next lesson.</p>



8. **Live Rappel Sequence**

- a. 1st-Low height flat open terrain.
- b. 2nd & 3rd– Medium height flat open terrain
  - **Shut down operation debrief 1st-3rd rappel.**
- c. Fourth rappel will be a training emergency Tie-off. It is recommended that this be accomplished at low to medium rappel height in flat open terrain.

➤ **Brief on ETO-Lead Instructor**

Rappel within 40' of the ground, stop close together, simulate knot that can't be undone, spread eagle, receive ETO signal, when signaled initiate and complete ETO, with simulation of removing knife and cutting rope. Signal "lift out" and "clear to flyaway" The helicopter will lift you a short distance then lower you to the ground. Spot your landing, wait for slack, simulate cutting your rope above the descent device, then untie ETO, unlock, unhook, and clear the aircraft.

➤ **Shutdown and debrief ETO**

- d. Fifth Rappel will be at high rappel height and in flat open terrain, or typical terrain at the discretion of the spotter
- e. Sixth rappel will be a high rappel height and in typical terrain
- f. Seventh rappel will be a high rappel on a side hill in typical terrain.
- g. Eighth rappel will be a maximum allowable rappel height and in typical terrain.

9. **Typical Terrain Rappels and Timber Rappel Briefing Points: (Lead Instructor)**

Stop and 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 they are a team with their rappel partner and should provide assistance if he or she is struggling once they have reached the ground and cleared from their rope.

10. **Discussion Points on typical terrain rappels**

- a. Typical terrain rappelling is very dynamic.
- b. Rappellers need to gather quick SA pertaining to the rappel site when they check their rope and throughout the rappel.
- c. Understand that rope control and speed on the rope is critical.

11. **Briefing items specific to Rappels in the timber:**

- a. Timing If you find yourself swinging, learn to time you decent to take advantage of open space below you.
- b. Understand the type of timber you are rappelling in for example ponderosa pines are not very forgiving (not the type you can slide through well, whereas Fir you can brush the side of and fight through reasonably well).
- c. It is critical that you constantly monitor your route of travel to the ground, the helicopter will drift around over the spot , you may find

yourself on the other side of the tree in short order. Again, this is when timing is your friend, don't go past the point of no return.

- d. Do not rappel past a problem . Locking off before you get into trouble is always an option, Problems such as; drift to the other side of the tree, a loop of rope around a limb, your rope bag stuck in the tree are good examples of why locking off is a good idea. Note: time spent while locked off can create more problems below you.

**12. Rappels on a slope**

Slope is very deceiving. Slow your decent. Check the slope, square your landing, position and stabilize yourself facing uphill prior to unhooking. Exit the site together to a safe area visible to the spotter or pilot.

**13. Communication,**

it is critical that you establish radio communication as soon as the ship leaves the site or if there is a critical problem with the operation at hand.

- 14. *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 a site open enough so the ropes do not travel through thick canopy.*

- 15. Check spotters will brief the pilots and spotters on timber rappels, timber rappels should be in a site open enough so the ropes do not travel through thick canopy. Techniques on safe timber rappels will be discussed and briefed.

**REMEMBER! DO IT UNTIL ITS RIGHT!**

**FOCUS IN THE MOMENT**

<b>Lesson</b>	<b>10- Equipment Care and Inspection/Documentation</b>	
<b>Objectives</b>	<ol style="list-style-type: none"> <li>1) Instruct students on how to properly inspect rappel equipment</li> <li>2) Introduce students to Chapter 3 of the IHRG on equipment inspection criteria.</li> <li>3) Inform students who is responsible for making repair or retiring rappel equipment.</li> <li>4) Introduce students to equipment and inspections logs.</li> </ol>	
<b>Time Frame</b>	Performance Based	
<b>Training Aids</b>	Equipment care and inspection power point presentation. Examples of related equipment issues. Ropes with bundles pulled out, cracked swages, chemical contamination etc. Genies with excessive wear, grooves as examples. Rappel equipment and inspection logs	
<b>Lesson Outline</b>		<b>Key Points</b>
<p><b>Equipment Division:</b> Test audio and visual equipment. Have powerpoint presentation ready to go. Have equipment and inspection logs available. Gather demo equipment.</p> <p><b>Lead Instructor:</b> Present power point, provide examples as appropriate, answer question. Show student how to fill out equipment and inspection logs.</p> <p><b>Check Spotter:</b> Monitor the group for questions</p>		