Interagency Helicopter Rappel Guide

The Interagency Helicopter Rappel Subcommittee (IHRSC) has developed this information for the guidance of its member agencies and is not responsible for the interpretation or use of this information by anyone except the member agencies.

The use of trade, firm, or corporation names in this publication is for the information and convenience of the reader and does not constitute an endorsement by the Interagency Helicopter Rappel Subcommittee of any product or service to the exclusion of others that may be suitable.

Helicopter Rappel Mission Statement

The Interagency Helicopter Rappel Program embodies a highly specialized, safe rapid method of aerial delivery of personnel and cargo in areas with limited landing sites.

The primary mission of the Interagency Helicopter Rappel Program is the safe and efficient aerial delivery of firefighters and cargo in support of local, regional, and national firefighting efforts, when appropriate.
MEMORANDUM

To: Users of the Interagency Helicopter Rappel Guide (IHRG)
From: NIAC Chair
Date: May 26, 2011
Re: Approval for publication of the 2011 IHRG

The Interagency Helicopter Rappel Unit (formally the Rappel Working Group) has revised the IHRG. The Interagency Helicopter Operations Subcommittee has endorsed this document and recommended it to NIAC for approval.

This memo serves as the NIAC approval of and authority to publish the submitted 2011 edition of the Interagency Helicopter Rappel Guide.

The IHRG will be maintained and updated as a Web-based document. Published hardcopies will not be available.

The 2011 IHRG is available online at: http://www.nifc.gov/aviation/av_reference.html

The Interagency Helicopter Rappel Guide constitutes operational policy for those federal and state agencies who have formally adopted it as such. All changes contained in the new guide are effective at this time.

The IHRG will be reviewed at a minimum of every three years and revisions will be made as warranted. With the issuance of this memo, The Interagency Helicopter Rappel Unit has the authority to update the IHRG, with the concurrence of the Interagency Helicopter Operations Subcommittee, as needed in matters relating to equipment and procedural issues. All other changes require NIAC approval.

Any questions regarding this approval can be directed to me.

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1 INTRODUCTION

1.1 Authority
Reference USFS, I Hog, and DOI Manuals and Directives that apply. Where requirements are not specific to a particular department or agency, it is so noted.

1.2 Objectives
The objective of the IHRG is to establish standardization of equipment, procedures and training to allow individuals or crews to be utilized for a variety of missions under varying conditions. To aid in this approach, methods are incorporated to cross-train personnel in more than one specific helicopter type.

1.3 Policies

Agencies having specific missions with technical requirements which cannot be met by this guide should provide a risk analysis and operations plan demonstrating need to utilize other methods or equipment. The plan shall be approved by the individual agency. All equipment and procedures will become the responsibility of that agency.

NOTE: If an agency chooses to incorporate the IHRG as policy within the agency’s directive system, it is essential that the user understand the use of language in the IHRG regarding mandatory or optional compliance. The use of verbs "must," "will" and "shall" conveys required compliance, the use of "ought" and "should" conveys required compliance except for documented and justifiable reasons; and use of "may" and "can" conveys optional compliance.

1.4 Risk Management
All flight operations have a certain inherent degree of risk associated with them. Training and the judicious use of available resources, including helicopters, can help reduce the degree of risk associated with a particular mission. Risk assessment and the fact that it must be an on-going process during an operation is vitally important to a rappel program. Risk assessment is the subjective analysis of physical hazards and operational procedures used to arrive at a GO/NO-GO decision.
1.5 **Responsibility**

An Interagency Helicopter Rappel Subcommittee (IHRSC) has been established; its members include management representatives and specialists presently involved in the rappel program. The responsibility of the Subcommittee is to exchange ideas and techniques with all involved throughout the program. Any revisions to the IHRG shall be addressed to the IHRSC. The IHRSC shall maintain and approve operational procedures and equipment for this guide. The Interagency Helicopter Rappel Guide will be revised every two years or more frequently if necessary.

1.6 **Utilization**

1.6.1 **Missions**

Rappelling expands the flexibility of the helicopter and crew and may enhance the overall safety of an operation. Rappellers can be considered a resource when formulating response plans for a Bureau, Region, Forest, Park, etc.

1.6.2 **Response**

Initial response on an incident can be expedited where travel time by conventional methods is time intensive and arduous. Rappelling can be utilized under a variety of terrain conditions which typically limit other access.
2 RAPPEL QUALIFICATION

NOTE: The certifying official at each level may require additional training of pilot, rappeller, spotter, or check spotter.

2.1 Pilot

A. Meets the appropriate requirements of the contracting document.
B. Is qualified and approved by an Interagency Helicopter Inspector Pilot for Long Line.
C. Qualified Spotter will brief, demonstrate, train, and familiarize the pilot on rappel operations and equipment.
D. Pilot will attend mock-up training. (Ground simulation of rappel operations utilizing aircraft).
E. Final approval for rappel operations will be based upon:
   1. Completion of spotter provided briefing and training.
   2. Demonstrate the ability to maintain a stable hover without using vertical reference during a series of simulated rappels and cargo letdown operations.
   3. Demonstrate the ability to coordinate with rappel spotter.
   4. Demonstrates knowledge of rappel emergency procedures during emergency procedures simulation and aircraft emergency procedures effect on rappel operations.
   5. Demonstrates the ability to perform Weight and Balance computations (including Center of Gravity) for rappel configuration.
F. Upon meeting all of the above requirements, the pilot may be approved by a qualified agency Helicopter Inspector Pilot for rappel or cargo letdown.
G. Proficiency: Each pilot must fly at least one error-free helicopter rappel sequence within the preceding 14 days. If proficiency is lost, an error-free mockup and helicopter rappel sequence flight must be completed prior to any operational rappel. If two proficiency rappel periods pass (28 days), the spotter with the concurrence of the Helicopter Inspector Pilot will insure the pilot is capable of deploying rappellers through the use of mockups and proficiency rappel flights. It shall be the responsibility of the local program manager to ensure proficiency requirements are met and properly documented on a unit log or equivalent.
2.2 Rappel Check Spotter

NOTE: Check spotters may suspend spotter or rappeller qualifications pending review at the next higher certifying level. Revocations of spotter/rappeller qualification will be determined at the appropriate State/Regional office.

2.2.1 Rappel Check Spotter Duties
A. Initial spotter evaluation and certification.
B. Monitor and provide oversight for rappel training.
C. Monitor operations for standardization purposes.

2.2.2 Rappel Check Spotter Position/Prerequisites
A. Must have been a qualified spotter for three seasons.
B. Must have demonstrated ability as an instructor and assisted in training at least two spotters.

2.2.3 Rappel Check Spotter Designation
Designation of Regional Check Spotters shall be approved for model specific platforms annually by their Regional Helicopter Operations Specialist for Forest Service; by the State Aviation Manager for BLM; by the Area Manager for BIA; or by the Regional Aviation Manager for NPS in the form of a designation letter. Other agencies and bureaus not listed above shall annually approve check spotters for their operations at a level in their organization commensurate with the positions above.

2.2.4 Rappel Check Spotter Proficiency
Each check spotter must maintain proficiency as a rappel spotter (see 2.3.4).

2.2.5 Rappel Check Spotter Annual Certification
Each check spotter must maintain currency as a rappel spotter (see 2.3.5)

2.2.6 Rappel Check Spotter Model Specific
If conducting an evaluation from a new platform or one they have never been qualified in, the check spotter must complete model specific spotter training prior to evaluating the spotter candidate. If previously qualified in the make and model they are doing the evaluation in but not current, the check spotter must complete all of the items required for model specific training EXCEPT the 3 live rappels.

2.3 Rappel Spotter:

2.3.1 Rappel Spotter Duties
A. Safely deploy rappellers according to policy outlined in this guide.
B Ensure only standard procedures and equipment found in this guide are used and followed.
C Provide instruction and certification for initial rappeller candidates and spotter trainees.

2.3.2 Rappel Spotter Prerequisites:
A Rappel Spotter Trainee Prerequisites
1. One fire season (90 days) of helicopter rappelling.
2. Qualified as Helicopter Manager Trainee.
3. Completion of 20 live rappels, with four of those being operational.
5. Other recommended training, Basic Supervision for First Line Supervisors, M-410 or equivalent, Contracting Officer Representative Level I, CRM, Risk Awareness (A-205) Ride along on rappel and or cargo missions.

B Rappel Spotter Certification Prerequisites
1. Meet the training, experience, and certification requirements for a helicopter manager as stated in their agency policy.
2. Currently qualified Incident Commander Type 4.
3. Assist in instruction of rappel training.
4. For a new program initiated within a bureau or agency, it will be the responsibility of the certifying officials and local managers to designate initial spotter trainees.

2.3.3 Rappel Spotter Training
A. Complete Helicopter Rappel Spotter Training Qualification Record and pass a final evaluation administered by a qualified check spotter.

B. The spotter trainee will be recommended for certification by a check spotter, reviewed by Regional Helicopter Operations Specialist for Forest Service; by the State Aviation Manager for BLM; by the Area Manager for BIA; or by the Regional Aviation Manager for NPS and certified by the local unit official. Other agencies and bureaus not listed above shall approve spotters for their operations at a level in their organization commensurate with the positions above.

2.3.4 Rappel Spotter Proficiency
Each spotter shall make at least one error-free helicopter or simulator spot in any 14 consecutive days. If a simulator spot is used to maintain
proficiency during any 14 days period, a helicopter spot must be completed during the next 14-day cycle. If proficiency is lost, an error-free simulator or mockup and helicopter proficiency spot must be completed prior to any operational spots. If two proficiency spot periods pass (28 days), a qualified and current spotter with experience in make and model being used will insure the spotter is capable of performing the spot through the use of mockups or training spots.

NOTE: Proficiency for spotters shall refer to maintaining currency during the current season.

2.3.5 Rappel Spotter Annual Certification

Each year, to re-qualify, a spotter must:

A. Meet fitness standards as outlined in prerequisites for rappeller candidates.

B. Attend and/or participate as an instructor at annual helicopter rappel training. This shall include re-qualifying as a rappeller.

C. Complete deployment of three typically configured loads of rappellers with cargo from helicopter to the satisfaction of a qualified Check Spotter with experience in make and model being used. *Typical terrain and a full complement of Initial Attack cargo shall be utilized for at least one of the three loads.*

2.3.6 Rappel Spotter Model Specific Training and Certification

Spotter must be evaluated by a qualified spotter in each make and model of helicopter that will be utilized as an operating platform. Spotter evaluators must be current in the make and model of helicopter being utilized.

The spotter will be briefed on and familiar with:
A. Rappel anchor and hard points for the specific model.
B. Seating arrangement for rappellers and spotters.
C. Rappel cargo placement/ location and deployment sequence and method.
D. Exit procedures, sequences, and emergency procedures.
E. Weight and Balance (including Center of Gravity Calculations) for the specific make and model of aircraft.

The spotter shall, to the satisfaction of the evaluating spotter or check spotter:

A. Demonstrate proficiency using mock-ups in the helicopter model to be used including:
   1. Preparing helicopter for rappel mission.
   2. Deploying both rappellers and cargo.
   3. Briefing by pilot on any peculiarities of the specific model.

B. Perform a minimum of three training rappel cycles (one low, one medium, and one high, see definitions Appendix I) with a full load of rappellers and cargo deployment.
2.4 Rappeller

2.4.1 Rappeller Prerequisites:

To be considered as an appropriate rappeller candidate, all of the following minimum requirements must be met each year as a condition to perform the duties of the position:

A. Meet the requirements for a Helicopter Crewmember Trainee as stated in their agency policy.

2.4.2 Rappeller Initial Training

All components of the rappel training must be completed in accordance with the Rappeller Training Syllabus to include the following:

A. Ground Training:

All rappeller trainees will complete ground training to include both ground and elevated platform training. This training must be performed in accordance with Appendix D of this guide, Rappeller Training Syllabus

B. Helicopter Mock-Up:

Trainee will demonstrate a rappel sequence and emergency procedures from a helicopter on the ground as initiated by the spotter, until proficiency is demonstrated from all seating positions.

C. Helicopter Rappels:

Rappeller shall complete a minimum of 8 live helicopter rappels without procedural error. These rappels must be in accordance with Appendix D of this guide.

2.4.3 Rappeller Performance Based Requirements

To be qualified as a rappeller an individual must perform the following performance based rappel procedures from and elevated platform with the full weight of rope (or equivalent) suspended below the rappeller:

A. Perform 3 simulator exits.
B. Perform 3 simulator re-entries from the pre-rappel position on the skid/step.
C. Untie 3 knots during simulator rappels
D. Complete 3 emergency tie-off procedures (ETO)
2.4.4 Rappeller Proficiency

Each rappeller shall make at least one error-free helicopter rappel in any 14 consecutive days. If proficiency is lost, an error-free simulator or mockup and helicopter proficiency rappel must be completed prior to any operational rappels. If two proficiency rappel periods pass (28 days), the spotter will insure the rappeller is capable of performing the rappel through the use of mockups and training rappels.

NOTE: Proficiency for multiple aircraft type: If certified in multiple aircraft models, proficiency may be maintained from one model to another with mock-up and safety briefing review. The 1 in 14 day proficiency rappel must still occur from at least one model.

NOTE: Proficiency for rappellers shall refer to maintaining currency during the current season.

2.4.5 Mid Season Error

During the operational season if a rappeller commits an error during a live rappel (proficiency or operational) the spotter will determine the severity of the error and follow one of the courses of action listed below. See Appendix D Rappeller Training lesson 1 for a full description of errors and penalties.

A Mid-Season Major

If a rappeller commits a major error during a live rappel (proficiency/operational) the spotter will not allow the rappeller to continue. Upon return to base the rappeller will be debriefed and be placed in loss of proficiency status (ref. IHRG) The major must be reviewed by the rappeller’s supervisor and a Check Spotter. The rappeller may regain operational status once proficiency performance elements are met or may (at the Check Spotter’s discretion) be removed from rappel operations. This may include additional live rappels. This option will only be available once per season.

B Mid-Season Minor

Occasional minor errors should be handled at the crew organizational level (spotter/ direct supervisor) and only elevated to a check spotter if it becomes habitual and cannot be rectified otherwise.

2.4.6 Annual Certification

To be certified as a rappeller a rappeller who has qualified the previous year will:
A. Meet fitness standards as outlined in prerequisites for a rappeller candidate.
B. Attend recommended Agency or Geographic Area basic helicopter safety refresher.
C. Participate in an equipment and procedures review.
D. Demonstrate knowledge of rappel principles.
E. Complete the performance based requirements outlined above in 2.4.3.
F. A rappeller will perform helicopter mock-up rappels and re-entry procedures as initiated by the spotter, until proficiency is demonstrated from all seating positions.
G. Complete three helicopter rappels without procedural error. Typical terrain shall be utilized for at least one of the three rappels.
H. Identify emergency situations and perform corrective actions without procedural error.

2.4.7 Rappeller Model Specific Training and Certification

A rappeller must be evaluated by a qualified spotter in each make and model of helicopter that will be utilized as an operating platform. A qualified spotter must be current in the make and model of helicopter being utilized.

The rappeller will be briefed on and familiar with:
   A. Rappel anchor and hard points for the specific model.
   B. Seating arrangement for rappellers and spotters.
   C. Rappel cargo placement/ location and deployment sequence and method.
   D. Exit procedures, sequences, and emergency procedures.

The rappeller will, to the satisfaction of the qualified spotter:
   A. Demonstrate proficiency as a rappeller using mock-ups in the helicopter model to be utilized.
   B. Perform a minimum of three training rappel cycles (one low, one medium, and one high) with a full load of rappellers and cargo deployment.

NOTE: If the exit procedure for the model the rappeller is current in is similar to the model being cross trained in (e.g. both exits are over skid) the rappeller will need a minimum of one rappel cycle with standard load to assure complete cycle of rappel operation and cargo.
3 Rappel Equipment

All equipment used in rappel operations will be approved by the Interagency Helicopter Rappel Subcommittee. Agencies having specific missions with technical equipment requirements which do not follow this guide shall operate according to their agency approvals. (See Chapter 1.3)

All equipment will be monitored during use for wear and stress related damage. Shortening the service life or removal from service of a special component may be done, as necessary, in order to maintain an adequate margin of safety in the program.

All proposed rappel aircraft shall be subject to a screening and evaluation process. All type III rappel helicopters must be certificated in compliance with 14CFR 27.143 paragraph (c).

3.1 Rappel Platform Training Simulator

A rappel platform simulating the cabin area, seating positions, and skid heights of the helicopter utilized must be readily available to each rappel base, preferably at the rappel base. The purpose of the platform is to train rappellers and maintain proficiency in exit and emergency procedures.

Requirements for the simulator are:

1. A minimum height of 20 feet above ground level. Rappeller experience will be greatly enhanced from a higher platform.
2. Simulator should approximate the helicopter to be utilized as near as possible, i.e., cabin configuration, seating positions, skid height.
3. The tower, stairs, platform, handrails, rappel anchor, and spotter tether attachment point shall meet agency and OSHA requirements for construction (Walking-working surfaces/1910).
4. The rappel anchor and spotter tether anchor must meet OSHA standards for fall-arrest (Fall protection systems criteria and practices/1926.502, Safety belts, lifelines, and lanyards/1926.104).
5. Rappel tower should be inspected annually and daily before any use. Program manager may delegate inspections. Example inspection forms can be found in appendix C.

Note: See MTDC Tech. Tip 0857–2354–MTDC for more information on tower design and construction.
3.2 Individual Rappeller/Spotter Equipment

**NOTE**: All rappel equipment that is removed from service (retired) must be destroyed to the point that it can no longer be utilized for its intended purpose. Any equipment that requires documentation must show retirement date on the “Equipment Log” when removed from service.

### 3.2.1 Helmets
Spotter and Rappeller Helmets must meet minimum standards for Interagency approved flight helmets as defined in the IHOG.

### 3.2.2 Eye Protection
For any rappel operation, rappellers must wear eye protection that meets ANSI Z81. The visor down on flight helmets meets this requirement.

### 3.2.3 Gloves

A. Spotters may wear any glove approved for flight operations in the IHOG. Spotters needing additional heat protection may wear a rappel type glove for cargo letdown. Currently Sullivan PV or PVG and the PMI GL2200x rappel glove and the Metolius climbing ¾ finger glove are approved for cargo letdown operation. The Metolius glove shall only be used in conjunction with a flight glove.

B. Rappeller's gloves shall be all leather with double-leather palm and fingers and provide sufficient heat protection for rappel descent. For wildland fire rappel operations the Sullivan PV (short) or PVG (gauntlet) Rappel Gloves are the approved gloves.

C. Inspection:

1. Inspect stitching for abrasion and wear.
2. Leather should be free from cuts or holes. Pay special attention to the area between thumb and forefinger.
3. Leather should also be inspected for oils, pitch, or other contaminants.
4. Hook and pile Velcro should adhere well when pressed together.
5. Gloves must be inspected by user prior to each use.
3.2.4 **Belly Deployment (BD) Bag**

BD bag must be designed in accordance with drawing # MTDC-1038. The Maximum weight of the BD bag shall not exceed 25 pounds. The female end of the Click lock buckle must be attached to the harness by a webbing loop manufactured in accordance with drawing #MTDC 1023. The webbing loops/buckles must be attached to the rappel harness below the rappel hook according to the directions in appendix O.1. Loose straps must be secured to prevent entanglement during the rappel process.

**A. Inspection:**
1. BD Bags must be inspected by user prior to operation.
2. Inspect stitching for abrasion and wear.
3. Zipper should function properly and store completely in pocket.
4. Check to ensure all buckles function properly.

3.2.5 **Required minimum rappeller personal equipment**

The following items are essential and must be carried on each rappeller during any rappel operation. These items are to provide essential safety and survival equipment in the event cargo equipment delivery is delayed.

A. Fire Shelter
B. Hard Hat
C. Leather gloves
D. Headlamp
E. 2 quarts of water
F. First Aid Kit
G. 10 AA Batteries
H. Space blanket
I. Food (1 meal)
J. 1 Fusee
K. Line Gear
L. BD Bag

The remaining items must be carried with each stick (2) of rappellers.

M. Radio
N. A map of the area
O. Compass or GPS
3.2.6  **Required minimum rappeller Initial attack cargo equipment list.**

In addition to the items above carried on the rappeller the following items must be delivered to each stick of rappellers in the cargo container.

- A  Food and water for 24 – 36 hours
- B  2 Handtools
- C  1 Tent fly (9x10)
- D  2 sleeping bags
- E  1 Roll of toilet paper
- F  6 Trashbags
- G  1 Firstaid kit
- H  2 Pack-out bags
- I  1 water treatment
- J  1 box(24) AA batteries
- K  2 Rolls of flagging
- L  100ft. of Parachute cord
- M  1 roll of fiber tape
- N  1 weather kit
- O  6 fusses
- P  1 Bastard file
- Q  IC Kit / Paperwork
- R  1 Pen (Sharpie)

3.2.7  **Spotter Harness**

Rappel and Cargo Letdown Spotters shall wear the Miller Revolution Harness during all helicopter rappel/cargo letdown and tower operations. The harness shall be issued and tagged with a unique identifier that corresponds to an in-service date. Harness tags from the manufacturer may be used. Two sizes are available.

- A  The small/medium size model RDT-QC/S/MBKU (will fit most spotters)
- B  A larger size harness model RDT-QC/UBKU is also available

C  Inspection:

1. The spotter harness must be inspected by the user prior to operation.
2. Inspect stitching and webbing for abrasion, wear or other damage.
3. Check leg strap buckles, chest strap buckles, dorsal D-ring and Cam Buckle adjusters for correct adjustment and function.
4. Check PivotLink connectors for correct function.
3.2.8 Extendable Spotter Harness Tether

The extendable harness tether is the interface between the spotter harness dorsal attach point and approved hard point. The extendable spotter tether for the Miller Revolution Harness RDT-QC/S/MBKU will be manufactured in accordance to drawing # MTDC-1039 Extendable Spotter Tether.

A. The harness tether must adjust to prevent the dorsal attachment point from extending past the door plane of the helicopter in the non-extended configuration.

B. The SMC Lite Alloy Steel carabiner is attached to the free end of the spotter tether connecting to an STC or manufacturer approved helicopter hard point, tower hard point, or other approved tether attachment point.

C. The extendable spotter tether comes in two sizes, large and small. The following tether will be used with each model of rappel helicopter.

1. Large Extendable Tether: Bell 205, Bell 210, Bell 212, Bell 214, MD 900.

The tether is designed to extend an additional 9 inches of length, as necessary to assist a rappeller in distress or to clear a letdown operation. To deploy, the spotter will free the red pull snap and lift the ejector snap releasing the v-ring. The additional tether webbing will deploy as tension is added to the tether. There is no need to manually deploy or unfasten DOT snaps.

When the extended length is no longer required, the spotter will recapture the v-ring into the ejector snap as soon as practical. Tether webbing within the pull DOT snaps will be repackaged when mission has ended.

When an extendable tether is operationally deployed, it is considered a reportable event. The SAFECOM system will be used for facilitated learning purposes.

D. Inspection:
   1. Tether is inspected with spotter harness prior to operation.
   2. Inspect stitching and webbing for abrasion, wear or other damage.
3. Metal hardware should be free from cracks, dings, or other damage.
4. Extendable tether material must be stowed by dot snaps
5. The tag end of webbing that locks the adjuster shall be tacked onto the webbing loop that passes through the dorsal D-ring using nylon 5 cord as shown in Appendix O.2.

3.2.9 Non-Extendable Spotter Harness Tether

The non extendable harness tether is the interface between the spotter harness dorsal attach point and hard point for the Miller Revolution Harness manufactured in accordance with drawing # MTDC-1062 Rappel Spotter Tether.

A. The harness tether must adjust to prevent the dorsal attachment point from extending past the door plane of the helicopter in the non-extended configuration.

B. The SMC Lite Alloy Steel carabiner is attached to the free end of the spotter tether connecting to an STC or manufacturer approved helicopter hard point, tower hard point, or approved aircraft tether attachment point.

C. The non-extendable tether will be used with the following aircraft.


D. Inspection:
   1. Tether is inspected with spotter harness prior to operation.
   2. Inspect stitching and webbing for abrasion, wear or other damage.
   3. Metal hardware should be free from cracks, dings, or other damage.
   4. The tag end of webbing that locks the adjuster shall be tacked onto the webbing loop that passes through the dorsal D-ring using nylon 5 cord as shown in Appendix O.2.

3.2.10 Rappel Spotter Tether Attachment

A. Rappel Spotter Tether Attachment will be manufactured in accordance with drawing # MTDC-946. The spotter tether attachment will secure the spotter harness tether to the aircraft, positioning it to the centerline of the aircraft.

B. The Spotter Tether attachment will be installed in the aircraft as outlined in model specific configurations (Appendix B of this guide.)

C. Inspection:
1. Inspected by a spotter prior to each use.
2. Inspect stitching and webbing for abrasion, wear or other damage.
3. Metal adjusters and attachment ring should be free from cracks, dings, or other damage.

3.2.11 Rappel Harness System

The Rock N Rescue HR-2 Wildland Fire Rappel Harness System is comprised of several components each requiring special consideration. This harness is the only harness approved for Interagency wildland fire rappel missions.

A. This harness shall be issued and tagged with a unique identifier that corresponds to an in-service date. Harness tags from the manufacturer may be used. The harness will be donned over the user’s head without disconnecting any hardware equipment.

B. Harness Inspection
1. The harness and connecting hardware must be inspected by the rappeller prior to operation.
2. Inspect stitching and webbing for abrasion, wear or other damage.
3. Check snaps, v-rings, and adjuster hardware for damage and correct function.

C. A 10mm Maillon Rapide Delta tri-link is the connection hardware used to attach the locking snap hook to the HR-2 harness soft loops. The tri-link is oriented with the barrel gate on the rappellers left side.

D. Tri-Link Inspection
1. Tri-link assembly will be inspected by the user prior to operation.
2. Check for damage to tri link hardware.
3. Ensure gate is closed with barrel locked.
4. Check that both harness soft loops are captured inside of the tri link’s hardware.

E. A Bourdon 1210 is a captive eye locking snaphook and the final piece of connecting hardware to the rappel harness. The tri link is trapped within the captive eye of the hook connecting it to the harness (figure 3.2). It is the snaphook that attaches the rappel harness to the descent device.
The Bourdon hook is stamped 1210 BH (for Bourdon Hook). These hooks have inspection criteria that will be conducted prior to any harness use.

F Snaphook Inspection:
1. Snaphooks will be inspected by the user prior to operation.
2. Check the hook and hook gate for cracks and wear.
3. Check the function of the spring-loaded gate and detent pin.
4. Ensure the end of the detent pin is peened and functions correctly.
5. Attempt to unscrew (turn left to loosen) the two halves of the detent pin. This pin can turn up to 360 degrees and still be within spec. If the pin unscrews completely, or the gate opens without the detent pin depressed, it is defective and WILL BE REMOVED FROM SERVICE.

G Replacement of Connecting Hardware:
The tri-link and locking snap hook may only be replaced by a qualified rappel spotter. After replacing any component of the HR-2 connecting hardware, the spotter shall tighten the locking nut on the tri-link with a wrench until it is not possible to unscrew the locking nut by hand (using fingers only). The spotter and rappeller will each independently verify the work performed and document their inspections by signing off in the harness log.

3.2.12 Rappeller Gunner Strap

For rappellers requiring a secondary restraint, Rappeller Gunner Strap shall be used. It shall be manufactured in accordance with drawing #MTDC-984.

A. Inspection:
1. Inspect stitching and webbing on belt and tether for abrasion, wear or other damage.
2. Ejector snap, v-ring, and adjuster should be free from cracks, dings, or other damage.
3. Ejector snap should release and reset to closed/ready position with minimal force.
4. Spring loaded gate on ejector snap should open when pushed and return to closed position when released.
5. The gunner strap and connecting hardware must be inspected by a spotter prior to each use.
3.3 Rappel Rope

All fire rappel operations will use Descent Control L4 Nylon Type 4 Rope. This rope manufactured by Descent Control, Inc. is one-half inch braided nylon manufactured in 250 foot lengths. Three metal swages, one inch apart, attach a metal eye (thimble) to each end of the rope.

The type of rope and length is stamped on the first (closest to the thimble) swage. The date of manufacture is stamped on the second (middle) swage and a manufacturer's unique serial number is stamped on the third swage. This unique serial number will meet the intent of the identification for documentation purposes. A different “unit” number can also be engraved locally or stamped by the manufacturer.

To maintain even wear and to maximize each ropes useful life, rope ends will be rotated after each rappel sequence. To track this, each end shall marked A and B respectively.

All ropes shall have a rubber jacket, 18” in length. This is to provide protection sufficient to minimize direct right angles to the rope, such as passing through a carabiner.

3.3.1 Rope Inspection

Refer to San Dimas TDC Memo issued May 1990, "Time in Service and On Condition Guidelines" (following) and Aviation Tech Tips, June 1992, 5700-9257, 1306-SDTDC section on recommendations regarding rappel rope care. This document is available on the web at: http://fsweb.mtdc.wo.fs.fed.us/search/ and search with keyword “rappel”. For rope documentation guidelines refer to chapter 4 of the IHRG. Nothing limits the discretion of either the spotter or the rappeller to retire a rope. Final retirement determination will be made by a qualified spotter. Inspection of any rappel rope should be done carefully and methodically.

When rope is in service, it shall be thoroughly inspected after every use. First, untangle the rope into a loose, knot-free or "flaked" pile on a clean surface. Next, inspect a short section at a time. Feel the rope, without gloves, for deformities, burrs, or anything out of the ordinary. Look for visual indications of abuse: puffs; boogers; heat glazing or anything that may indicate rope damage. If damage is apparent, remove from service and document on the rope log sheet.

Swages and thimbles shall be inspected for deformity, cracks, and sharp edges (see Safety Alert IA 08-08). Sharp edges on swages or thimbles may be smoothed using emery cloth or a fine file. Make sure metal filings
do not drop into rope weave. Thimbles and swages should be snug. If not, return to manufacturer or retire it.

After the rope has been inspected and ok’d for service, a tag will placed through the thimble to signify the rope is OK for use.

A. Inspection / Retirement Criteria

1. Ensure rope is not used more than five years after its manufacture date.
2. Ensure rope is not used more than 100 rappels per end
3. Any portion of the rope has been cut or severed in any way.
4. There are burns or significant wear marks over 50% of the rope length.
5. There is visible damage which would compromise its strength or safety.
6. When more than 25% of surface strands have been pulled out in a loop, and cannot be worked back into rope.
7. There is evidence of several bundles bonded together by heat.
8. The rope is contaminated with foam concentrate, retardant, or any petroleum product.
9. There is any damage which affects more than 25% of any woven strand of the rope, such as a cut.
10. Cracks or gross deformities appear on metal components.
11. Any evidence of incorrect rope splicing
12. Any rope found to meet the definition of a “twisty rope” (See Appendix I)

3.3.2 Rope Use Care and Storage

A. Factors that affect service life of ropes

1. Heat: It is imperative to document any type of heat damage to rappel ropes. Although some ropes may be more tolerant to heat damage than others, it can be assumed that if a rappeller can smell a pungent odor of burning nylon, sufficient damage has been caused to create concern and necessitate close inspection and documentation in the rope log. During fast
descents there is little friction developed while descending. As the rappeller nears the ground, friction is applied to slow the descent. This generates heat quickly. As the rappel device absorbs heat, it may become hot enough to glaze or melt the rope, especially when coming to an abrupt stop on a long descent.

For nylon rope, a critical temperature of 350° F will cause breakdown in fibers. At 480° F, melting will begin. A rapid rappel to minimize exposure under a hovering helicopter will inevitably cause heat damage, reduce rope life, and may require immediate rope retirement, even with a new rope. To minimize potential for heat damage, do not allow the descent device to heat to the point where it will melt the rope fibers. To accomplish this, vary the rate of descent or amount of friction applied to the descent device. This will decrease any steady heat buildup by allowing some cooling of the device between braking. After each rappel, visually check the rope for glazed areas or feel for hard, stiff areas that may indicate heat damage. If any damage is found document it on the rope log sheet. If there is any doubt concerning extent of rope damage, retire the rope.

2. Dirt: Any contaminant which works into the fibers and construction of the rope will cause deterioration. Mud, dirt, and sand have sufficient grit to cause abrasion to rope fibers. Because of the potential for fiber abrasion, ropes should not be stepped on. Look for excessive mud and dirt. Feel the rope for grit, cheat grass, or other particles that could possibly work into the rope. Avoid dragging the rope over the ground.

3. Chemicals: Contact with acids or bleach must be avoided. Chemical damage to ropes can occur and may not be visually detected. Because of this potential hazard, ropes should always be stored in a rope bag away from batteries and chemicals. Alkalis, oxidizing, and reducing agents (e.g., bleach, fire retardant, or foam) are all known to be damaging to nylon. Nylon is unaffected by hydrocarbons; however, additives in these agents may adversely affect the rope.

4. Cross-Contamination: Any surface that ropes or other rappel gear may potentially contact should be inspected for the presence of contaminants that can damage ropes, gloves, harnesses, and other gear. Textiles and leather can absorb and transfer contaminants to other gear. Petroleum products can reduce the friction between rope and Sky Genie, making a rappeller's descent harder to control. Pitch from coniferous trees
can increase the friction between rope and Sky Genie, making it more difficult to descend. Fire retardant contains powerful corrosive agents that can damage metal hardware. Any source of contamination, including dirty fire shirts with chainsaw bar oil stains on the shoulder, dirty Nomex pants, and dirty/retardant covered line gear, must not be allowed to come into contact with ropes, gloves, harnesses, Sky Genies, carabiners, and other rappel gear. Ropes and rappel gear should always be stored in a clean, dry, chemical-free, rodent-proof locker or vehicle compartment when not in use. The interior seats and cabin of helicopters used for rappelling must be kept exceptionally clean.

B  Rope Care

1. Ropes that are redirected at an angle, such as over a doorsill or through a carabiner, shall have a rubber hose jacket to give protection. It must give sufficient protection to minimize direct right angles to rope and eliminate rope damage on edges. All ropes used for rappelling shall be ordered with a protective hose.

2. If ropes accidentally become wet, the ropes should be air dried, away from direct sunlight. Do not lay ropes on a concrete floor, as acid is often used in concrete work and may last for years. Drying ropes on asphalt parking lots should also be avoided. Never dry a rope in clothes dryer. The temperatures are hard to control and heat damage may occur.

3. To extend service life of equipment be sure to: Avoid stepping on ropes.
   • Avoid prolonged exposure to sunlight; dry ropes in the shade.
   • Never expose ropes to rough surfaces.
   • Avoid dragging ropes on the ground.
   • Descent devices will be removed whenever ropes will be stored more than one operational period.
   • After ropes have been released from helicopter, avoid dragging ropes across limbs and brush whenever possible. The fine nylon fibers that make up the Descent Control rope are very susceptible to snagging.
   • Avoid contact with all chemicals that may contaminate rope.
   • Keep ropes away from heat sources.
   • Avoid laying ropes on concrete or asphalt.
• Avoid contact of the rope with Velcro.

C. Storage

All ropes shall be stored under clean, dry, cool conditions. Any rope stored in its original packaging in a cache or warehouse shall not be stored directly in contact with the floor. The ambient temperature shall be maintained between 0° F and 100° F. After placed in service, ropes may be stored in rope bags, provided that clean, dry storage conditions prevail.

3.3.3 Procedures for Conditioning New rappel Ropes

A. Remove new rope from plastic shipping bag and randomly flake into a pile on a clean, dry surface (not concrete or asphalt).

B. Carefully inspect entire rope, including swages and thimbles, for visible defects. If no significant defects are discovered and rope appears serviceable, enter initial rope data into rappel equipment log and record pre-use inspection.

C. Randomly flake rope into rappel rope bag.

D. Select an open, flat area with a clean dry surface to lay out rope. Secure swivel to a fixed hard point 2 to 3 feet above ground level.

E. Use carabiner to attach eye of free rope end to swivel.

F. Walk with rope bag away from attach point to lay out rope in a straight line. Do not drag rope over the ground.

G. Stretch full length of rope by pulling on opposite end from swivel; apply tension by having one or two personnel pull on the rope end (do not use mechanical means to accomplish this task, such as pulling on the rope with an ATV, winch, or block-and-tackle). If tension on rope causes the swivel to spin, hold tension until spinning ceases. The amount of tension applied should be sufficient to briefly lift most or all of the rope off the ground.

H. Attach the Sky Genie to the rope in the same way it would be rigged for rappel, with the upper (thumbscrew) end toward the swivel.

I. Starting at the end to which the swivel is attached, walk the full length of the rope while - sliding the Sky Genie along the rope. When the end is reached, remove the Sky Genie, walk back to the starting point, and re-attach the Sky Genie to the rope. Walk the rope 9 more times in this direction.

J. Disconnect rope from swivel and re-bag rope. Attach opposite end of rope to swivel. Repeat steps F through I. This process must be
documented in the rope log. However it does not count toward the use life of the rope.

K. If at any time during this process the rope begins coiling below the Genie to the extent that it interferes with the rappeller’s ability to slide the Sky Genie to the end of the rope, the rope should be logged as a twisty rope and removed from service. No more conditioning or rappelling with this rope should be permitted. In addition, a Safecom should be filed for any rope that is removed from service because of excessive twisting.

L. If the rope does not show signs of twistiness during the break-in process, completion of the conditioning process should be recorded in the rope log.
3.4 Descent Device

A For helicopter rappelling, the one-half inch Sky Genie. (Model no. #14GO), manufactured by Descent Control, Inc., shall be used by all fire rappel operations. This is a two-piece descent device, shaft and cover. (Cover will have the Interagency Wildland Fire Helicopter Rappel Genie Decal on it). Users shall engrave identical identification numbers on both the Genie shaft section and cover to insure that these components remain together for the life of the Sky Genie. Engrave the unique indentifying number on the shaft section across the top of the lock-off horns. A matching number will be engraved on the lower left corner of the genie cover with a small decal area removed for easy engraving.

B A standard of 2½ wraps around the shaft shall be used. The rope shall enter the front and exit the back of the cover and show two wraps in the cover window. Follow the arrow on the shaft for direction of wraps. It must be used only with the Descent Control, Inc., one-half inch diameter rappel rope (Type 4). The retirement life for the Sky Genie is based on the wear grooves on the shaft. Sky Genies shall be retired after a 1/16-inch deep wear groove is observed.

C To extend service life of equipment be sure to:

   1. Avoid rough handling
   2. Not drop or drag on the ground
   3. Store Genies with covers installed when not in use
   4. Keep Clean

D Post Rappel Inspection
After each rappel, inspect for:

   1. Dents in cover
   2. Rough or sharp surfaces on cover and shaft
   3. Scratches or excessive wear on shaft
   4. Faulty detent pin or locking screw
   5. Cracks or breaks
   6. Cover fitting on shaft
   7. Dirt, tree sap, etc.
   8. Wear on cover, inside or out, at thumb screw slot or detent pin hole
   9. Reference IA 09-03
3.5 Ancillary Equipment

3.5.1 Carabiners

Only the SMC Lite Alloy Steel Locking carabiner is authorized for all rappel and cargo letdown use. (Exception: carabiners specifically identified by supplemental type certificate (STC) for direct attachment to anchor).

**NOTE:** Carabiners are designed to be loaded longitudinally; if load occurs on the side(s), gate failure may occur.

A. For programs wishing to identify their equipment, Seattle Manufacturing Corporation (SMC) has released guidelines for the proper way to permanently mark their mountaineering, rescue, industrial and work-safety products. Additional information can be obtained [http://www.smcgear.net/news/4-smc-announces-guidelines-for-permanent-marking-of-gear](http://www.smcgear.net/news/4-smc-announces-guidelines-for-permanent-marking-of-gear)

1. It is only acceptable to use a hand held electric type engraver to place identifying marks on hardware. DO NOT strike with a hammer and stamps or ever use other similar methods. Once the marking process has been completed ALWAYS inspect the product for proper fit and function PRIOR to returning it to service. If you ever have concerns or questions you are advised to contact SMC directly at 1-800-426-6251 or info@smcgear.net

2. For carabiners it is recommended to mark along the spine of the frame. DO NOT mark on or near the lock or pivot tabs of the frame and stay away from rope bearing areas. DO NOT mark on the gate. For steel and stainless products use a medium setting with medium to heavy pressure. For Aluminum products use a low setting with light to medium pressure. Depth of engraving equal to the thickness of a piece of paper should be enough to last the life of the product.

B. Inspection:

1. Inspect to be sure that gates and locking mechanism function properly. If gate becomes sticky, remove from service.

2. Look for abrasion, burrs, or rough edges. If there is any visual indication that raises question, retire it.

3. When using for rappel or cargo letdown operations carabiners make certain that: Gates are locked when in use. Pull is not on gate. Carabiners are not dropped on ground or hard surface. Rough handling is avoided. Carabiners are kept clean.

4. Carabiners shall be inspected by a spotter prior to each use.
3.5.2 **Knife / Knife Sheaths**

All rappellers and spotters are required to have a hook knife, with lanyard, readily accessible for emergency use. The Raptor knife is required for use by rappellers and spotters. Spotter may elect to remove lanyards from their knives to allow greater range of movement.

A. The rappeller Raptor knife shall be enclosed within the MTDC rappeller Raptor sheath (MTDC drawing 1041) and attached to the rappel harness in the manner shown in rappel bulletin 021103.

B. The spotter Raptor knife shall be enclosed within the MTDC rappel spotter Raptor sheath (MTDC drawing # 1042) and attached to the spotter harness in the manner shown in rappel bulletin 051005.

C. Certain STC’s for rappel anchor installations require an additional Raptor knife be installed inside the aircraft.

D. Inspection:

1. Knife sheaths are to be inspected with any harness inspection.
2. Knives shall be inspected annually or prior to being installed on a harness. Ensure knives used for rappel have properly installed blades.
3. Knife blades must be changed after any use and will be closely supervised by a rappel spotter. See Appendix O.4
4. Handle/body of knife should be free from damage, screws should be tight.
5. The sheath should be in good condition.
6. Ensure the lanyard is stowed and attached correctly.
7. Pull snap(s) should close/open with enough resistance to prevent inadvertent opening.
3.5.3 Safety Snub Strap

An approved safety snub strap will be utilized as a backup device to securely connect rope(s) to the rappel anchor(s) or to one another. The snub straps shall be manufactured in accordance with MTDC drawing #958 for double rope capable anchors. Single anchor, single rope snub straps shall be manufactured in accordance with MTDC drawing #995 for overhead anchor.

A. Inspection:
   1. Inspect stitching and webbing for abrasion, wear or other damage.
   2. Body of static line snap(s) should be free from cracks, dings, or other damage.
   3. Detent button(s) should depress and reset to closed/ready position with minimal force.
   4. Sliding cover should open and return to the closed position easily.
   5. Inspect body and cover for burrs or sharp edges that could damage ropes.
   6. Snub Straps shall be inspected by a spotter prior to each use.

3.6 Rappel Anchors

Rappel anchors are evaluated for use by the Aviation Management Directorate (AMD) for DOI operations or the National Airworthiness Logistics Officer for USFS use. Each helicopter model will be evaluated for anchor hard points and design to determine the proper rappel bracket or brackets that may be used.

A. Rappel Anchor Inspection

Rappel Anchor inspection will occur in accordance with the applicable STC, continuing airworthiness instructions, or manufacturers standards in the flight manual or maintenance manual. In addition an annual inspection shall also be conducted.

The designer (or manufacturer) of the anchor is responsible for developing a maintenance inspection criteria, which ensures the continued airworthiness of the anchor. The owner of the anchor is responsible for ensuring that the inspection(s) is conducted. Prior to each day of use, the rappel anchor shall be visually inspected by the spotter for general condition.

Additional information regarding existing rappel anchors is available from MTDC.
4 DOCUMENTATION

All rappel logs are official documents and will be kept in RAPREC or on the forms contained in Appendix C. Rappel logs will be archived for a minimum of 7 years.

NOTE: All electronic records (RAPREC) need to be backed up to an external drive or server. A hard copy of electronic record will be printed at least once annually.

NOTE: All rappel equipment that is removed from service (retired) must be destroyed to the point that it can no longer be utilized for its intended purpose. Any equipment that requires documentation must show retirement date on the “Equipment Log” when removed from service. All rappel equipment retired remains government property and should be handled according to policy.

4.1 Training, Certification, and Proficiency

NOTE: For fire operations, copies of certifying and recertifying documentation will be maintained in individual permanent records and forwarded to the IQCS Account Manager.

4.1.4 Rappeller
The rappel crewmember training record shall document each individual step in the training. Competency at each level of the training must be demonstrated by the trainee before the spotter shall permit advancement to the next step. Each rappeller will maintain a record of training, proficiency and operational rappels. See Appendix C.

4.1.5 Spotter (Rappel and Cargo-letdown)
The Helicopter Rappel or Cargo-letdown Spotter Qualification Record shall document each individual step in the training. Competency at each level of the training must be demonstrated by the trainee before the spotter shall permit advancement to the next step. Each spotter will maintain a record of training, proficiency and operational spots of rappellers and cargo. See Appendix C.

4.2 Rappel Unit Log
All rappels must be entered into a rappel unit log. Unit logs shall be readily available for review. Information will be documented on Rappel Unit Log in appendix C or RapRec equivalent.

The spotter or rappel base manager will ensure information is entered into the logs in a timely manner and the logs are kept current.
4.3 Equipment logs

All equipment requiring documentation will be assigned a unique identification number. The number will be retired with the piece of equipment. The following equipment shall have a log assigned. See Appendix C.

4.3.4 Rope

A. Documentation must be maintained for all rappel ropes. A log shall be maintained from the date of purchase until the rope is removed from service. The rope log shall be readily available for review. Each rope must have an identification number and be marked at both ends, one end marked "A" and the other end marked "B" (reference Chapter 3.3.1).

B. All rope uses shall be documented. After inspection, any irregularities will be noted and brought to the attention of the spotter. Documented information will dictate when to retire a rope from service. Use Rappel Rope Log in Appendix C or RapRec equivalent.

4.3.5 Personnel Descent Devices

Use and inspection of any descent device shall be documented on a Descent device log. Cover and shaft shall have the same identification number and shall always be used together. Numbers shall be engraved according to Chapter 3.3.2. After each rappel, the descent device shall be inspected for wear or deformity and remarks noted. When a rappel device is retired, it shall be destroyed to eliminate further use. Use Descent Device Log from Appendix C or RapRec equivalent.

4.3.6 Rappeller / Spotter Harness

Harness will be inspected annually and recorded. Any deficiencies during pre-use inspections and or repairs or component replacement will be noted. The harness log form in Appendix C or RapRec equivalent must be used for harness documentation.

4.3.7 Cargo Letdown Line

All cargo letdown line use shall be documented. After inspection, any irregularities will be noted. Use the Letdown Line Log from Appendix C or RapRec equivalent.

4.3.8 Rappel Tower Anchor

Use and inspection of rappel tower anchors shall be documented. Example forms are located in Appendix C. Bases may use other forms, provided the forms provide at a minimum the information listed below.

A. Date put in service
B. ID number
C. Remarks/problems
D. Type of use (Helicopter or tower)
E. Inspector’s name/date inspected
5 Rappel Operations

5.1 Administrative Responsibilities

The spotter shall be responsible for coordinating all rappel activities (pre and post rappel). Before departure the spotter must consider the operational factors and local unit recommendations that influence departing the base of operations configured or equipped.

5.2 Pre-Rappel Briefing

Prior to any rappel mission, the spotter must brief all personnel involved as to the nature of the mission and its location, and provide pertinent information to accomplish the rappel mission. The information should include environmental concerns (weather, wind, terrain landing areas, density-altitude, etc.), individual responsibilities and incident specific information. Prior to any rappel operations the pilot and spotter will identify the performance limitations for that aircraft used. These limitations will ensure the performance is in the maximum continuous range. Before replying “Power is Good” during the following sequence, the pilot must ensure these limitations are not exceeded.

NOTE: Weight & Balance (W&B) calculations will be performed for standard rappel configurations and emergency rappel scenarios prior to the commencement of rappel operations each season. The purpose is to ensure the center of gravity (CG) will remain within limits. Because of the dynamic environment of the rappel operation where rappellers and spotters move inside and out of the aircraft in flight, it may be possible, particularly in light helicopters, to exceed the aircraft’s CG limitations during rappel operations. In cases where it may be possible to exceed a CG limit during normal or emergency situations, W&B calculations will be performed prior to each rappel mission accounting for actual rappeller, spotter, and cargo weights. If a mission specific W&B calculation indicates the CG could be exceeded during any phase of the rappel operation the load configuration must be adjusted or the mission aborted. Calculation documentation must be maintained at base of operations.

5.3 Pre-Flight Procedures

5.3.1 Aircraft Configuration

Configure Helicopter for rappel operations following model specific instruction in Appendix B of this guide.

5.3.2 Seating Configuration

Specific seating arrangement for each aircraft must be approved in the aircraft flight manual or Supplemental Type Certificate (STC).
Seating Configuration will follow instructions for specific aircraft in Appendix B.

5.3.3 Loading Cargo
Spotter oversees loading and securing of cargo. Cargo shall be installed in the aircraft as described in appendix B. Cargo shall be restrained utilizing approved restraint system.

5.3.4 Anchor
Spotter visually inspects rappel anchor (see chapter 3, Rappel Anchor inspection.)

5.3.5 Rigging Anchor
Rig helicopter rappel anchor for rappel operations following model specific instruction in Appendix B of this guide.

5.3.6 Buddy Check
NOTE: All steps of the Buddy Check are to be performed visually or visually and tactilely for thoroughness. Rappeller being checked will be attentive to each step of the Buddy Check process. If a discrepancy is found this check needs to be started over from the beginning.

*Items below in bold must be checked both visually and tactiley.

A. FLIGHT HELMET
   1. Condition - (no cracks or damage)
   2. Eye protection –
      • visor down & tight or approved eye protection on with visor up & locked
   3. Mic boom up and tight
   4. Chin strap secured, adjusted to fit snuggly, with no loose ends.
   5. Avionics cord tucked into Nomex shirt or flight suit (As Appropriate)

B. NOMEX
   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. HARNESS
   1. Risers –
      • snuggly fitted
• webbing and visible stitching in good condition
• no twists
• buckles secured with no visual defects
2. Lat Straps -
  • snugly 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. Zipper 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 indicate 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.
6. Indicate rappeller to turn around With a tap on the left shoulder
K. EXCHANGE THUMBS UP - “I AGREE, I AM O.K.”
L. ROPE / DESCENT DEVICE INSPECTION (type 3 aircraft)
   1. Check thimble
   2. Inspect swages
   3. Inspect rope protector (if applicable)
   4. Descent Device rigged correctly (rope in the front, out the back 2 wraps in the window to the right)
   5. Check that descent device detent pin is out
   6. Thumb screw snug
M. EXCHANGE THUMBS UP - “I AGREE, I AM O.K.”

5.3.7 Rappeller / Spotter Check
NOTE: Spotter being checked will be attentive to each step of the equipment check process. If a discrepancy is found this check needs to be started over from the beginning.

A. FLIGHT HELMET
   1. Good Condition - no cracks or damage avionics in place.
   2. Eye protection – Not required for a spotter.
   3. Chin strap secured, adjusted to fit snugly, with no loose ends.
B. NOMEXSHIRT / FLIGHTSUIT
   1. Good Condition Shirt tucked in collar up, Buttoned to the top, Flight suit fully zipped up.
   2. Sleeves - (no holes, clean & tight at wrist)
C. GLOVES
   1. Gloves in good condition, fastened with no loose ends, pitch or contaminants
D. MILLER HARNESS – Front Side

1. Risers –
   - visible webbing & stitching in good condition
   - no twists
   - buckles secured with no cracks
2. Chest Strap
   - Positioned Mid Chest
   - Buckled & snugly fitted
3. Visible webbing & stitching in good condition with no twists & keepers in place
4. Leg Straps
   - Buckles attached, no fabric caught
   - Visible Webbing & stitching in good condition
   - No twists, snug fit, loose ends secured keepers in place
5. Raptor Knife
   - Secured in sheath on left riser
   - Horn facing to left side
   - Lanyard stowed

E. NOMEX & BOOTS

1. Nomex pants/ flightsuit in good condition, no Velcro showing
2. Pant cuffs over approved leather boots

F. Indicate Spotter to turn around With a tap on the left shoulder

G. SPOTTER’S BACK SIDE

1. Helmet in good condition
2. Collar up
3. Harness - visible webbing & stitching in good condition with no twists
4. Spotter tether attached to dorsal O-Ring through double pass adjustor and tacked.
5. Extendable tether stowed, all snaps in place.
6. Ensure Carabiner in place at end of tether
7. Buckles & loose ends secured
8. Nomex shirt/ flightsuit & pants - (no Velcro showing )
9. Pant cuffs over approved leather boots

H. Tap on shoulder to indicate spotter to turn around.

I. EXCHANGE THUMBS UP - “YOU ARE O.K., I AGREE”
5.3.8 Boarding Sequence Medium Helicopters

A. Rappellers complete buddy check (5.3.7), organize into proper rappel order and prepare to board the aircraft. Rappellers load from inboard seats out.

B. Starting with rappellers boarding on right side of aircraft then moving to left side, spotter performs equipment check on each rappeller. If all is correct, a thumbs up signal is exchanged. If a discrepancy is identified, it will be immediately corrected and the spotter will restart the equipment check from the beginning.

C. Once complete, each Rappeller boards aircraft and takes pre-assigned seat. The first rappeller boarding on each side will perform a full inspection of the rigged descent device(s), rope attachment, and safety snub strap, then attaches their gunner strap.

D. When attached, the gunner belt ejector snap will be on the right, v-ring on the left, the connection will be on right side of rappeller’s body. Gunner strap will be worn taut around rappeller’s waist. Rappellers then buckle seatbelt and plug into ICS system if appropriate. Gunner strap and seatbelt must be below the snaphook.

E. Last rappeller to be checked completes equipment check on spotter (5.3.8) prior to boarding the aircraft. If all is correct, a thumbs up signal is exchanged, then rappeller boards aircraft.

F. Spotter completes preflight walk around.

G. Spotter enters aircraft, checks descent devices, ropes, snub strap, and hard point connections. Spotter taps inboard rappellers knees and points to rigging. Thumbs up signal between spotter and inboard rappellers indicating inspections have been performed.

H. Spotter, checks rappellers seatbelts and gunner straps, and ensures doors are shut and secure.

I. Spotter, connects tether, plugs into radio system, takes seat, fastens seatbelt, displays tether showing carabiner attached to hard point and seatbelt secure. If all is correct, a thumbs up signal is exchanged with all rappellers on board.
5.3.9 Boarding Sequence Light Helicopters

A. Rappellers complete buddy check, organize into proper rappel order and prepare to board the aircraft.

B. Starting with rappellers boarding on right side of aircraft then moving to left side, spotter performs buddy check (5.3.7) on each rappeller. If all is correct, a thumbs up signal is exchanged. If a discrepancy is identified, it will be immediately corrected and the spotter will restart the buddy check from the beginning.

C. Once complete, each rappeller perform a full inspection of the rigged descent device, rope attachment, and safety snub strap, then hooks up to descent device, adjusts rope length from the anchor, positions themselves on the skid and locks-off and waits for spotter. Spotter then checks rappeller’s rope and connection in the following order.

   1. Anchor Bolts Secure
   2. Carabineer captures anchor and is oriented correctly.
   3. Carabineer captures thimble, check tactiley to insure gate is locked
   4. Snub snap attached between first and second swage
   5. Check that rope protector is adjusted correctly if applicable
   6. Verify descent device is rigged correctly
   7. Verify snaphook is hooked into descent device.

   If all is correct a thumbs up signal is exchanged. Rappeller then enters aircraft, takes seat, buckles seatbelt and plug into ICS system. Seatbelt must be below the snaphook.

D. Last rappeller to be checked completes equipment check on spotter (5.3.8) prior to boarding a/c. If all is correct, a thumbs up signal is exchanged.

E. Spotter completes preflight walk around.

F. Spotter enters aircraft, checks rappeller’s seatbelts and ensures aircraft cabin is secure.

G. Spotter connects tether, plugs into radio system, takes seat, fastens seatbelt, displays tether showing carabiner attached to hard point and seatbelt secure. If all is correct, a thumbs up signal is exchanged with all rappellers on board.
5.3.10 Rope Security

Prior to flight, spotter will ensure rope(s) and rope bag(s) are secured in the aircraft. After rappel configuration is complete spotter ensures positive control of rope bag is maintained by the rappeller closest to the exit door, throughout the duration of the flight or until rope(s) are deployed for rappel.

5.4 IN-FLIGHT PROCEDURES

All communications between spotter and pilot will be done in the form of challenge and response.

5.4.1 Pre-Rappel Sequence

The safety of personnel and aircraft must be the primary consideration when the spotter and pilot select rappel or landing sites. The pilot shall be the final authority on flight procedures. Fire behavior and safety shall also be considered when selecting the site. Before deploying personnel, the spotter shall brief the rappellers on the site selection and fire safety.

A. Pilot(s) flies a high level reconnaissance of the area. The spotter works with the pilot to select an appropriate rappel site, identify hazards and an emergency site.

B. Contact appropriate flight following authority (ATGS, HLCO, dispatch, etc.) prior to commencing the rappel operation. Spotter communicates with flight following authority & pilot regarding number of rappellers to be deployed.

C. Confirm the number of descent devices match the number of rappellers being deployed. When necessary remove and stow unneeded descent devices.

D. Adjust radios as needed to ensure pilot and spotter communication will not be compromised by excessive radio chatter. Radios must remain on and dialed to the appropriate flight following frequency.

E. Where possible helicopter should maintain at least 50ft. clearance above any obstacles before starting a rappel.

F. If this is not possible and helicopter must descend below the canopy, rotor clearance must meet the current standards in the IHOG

G. Before starting rappel operations, A HOGE Power check is accomplished at an altitude comparable to the rappel site or greater. A Positive rate of climb must be established without exceeding aircraft limitations. Pilot states” hover established, positive rate of climb, power is good.”

H. Spotter responds “power is good”
I. If configured spotter directs rappellers to unplug and stow ICS communications.

5.4.2 Rappel Sequence Medium Helicopters
A. Pilot states to spotter “1 minute out airspeed below 40 knots.”
B. Spotter responds “1 minute out, below 40 Knots, coming out of my seatbelt.”
C. Spotter activates hot mike if not done already.
D. Spotter states to pilot, “opening aircraft door(s).” Once spotter has opened aircraft doors, spotter states to pilot “reset Master Caution”.
E. Pilot responds “Master Caution reset”.
F. Spotter / pilot communicate adequate rotor clearance, power assessments, and rappel spot status throughout the rappel sequence. Using pilot’s perspective (left, right, forward, back, and up or down relative to altitude above the ground.)
G. Once over the rappel site Spotter states to pilot, “Ready to drop ropes. How’s the Power”.
H. Pilot confirms power, if within limits; pilot responds to spotter “power good, drop ropes”.
I. Spotter drops rope outside skid and ensures it is free of knots and rope bag is on the ground. Spotter repeats process for second rope. If the spotter identifies a knot or other problem on the rope, this must be communicated to the rappeller. The rappeller must acknowledge.
J. Spotter states to pilot, “Rappellers hooking up, ”
K. Pilot responds” hooking up rappellers”.
L. Spotter then gives “Remove Seatbelt signal” to each rappeller.
M. Rappeller(s) remove seat belt, slides to outboard position, grasp descent device, orient, and hook up and lock off, places right hand on gunner release and presents hook up and lock off to the spotter. Rappeller does not leave seat for this procedure.
N. Spotter confirms the rappeller’s hook-up and lock off by visual and tactile inspection
O. Spotter states to pilot, “Rappellers to the skids,”
P. Pilot responds “Rappellers to skids”
Q. Spotter gives “Move into Position” hand signal to rappeller(s). Rappellers remove gunner strap, move to the skid, gets set, clears rope, returns focus on the spotter. If the rappeller identifies a knot or other problem on the rope, this must be communicated to the spotter. The spotter must acknowledge.
R. Spotter states to pilot, “Ready to send rappellers, How’s the Power”.

S. Pilot confirms power, if within limits; pilot responds to spotter “power good, send rappellers”.

T. Spotter responds “Sending rappellers” and gives “Begin Descent” signal to each rappeller.

U. Rappeller(s) unlock, transition over skid, and descend to the ground.

V. Spotter states to pilot, “Rappeller off the skid… half way… on the ground.”

W. After reaching the ground, rappeller(s) disconnect from rope(s), feed approximately 10 feet of rope through the descent device to place descent device on the ground, and move to a safe area. Rappeller(s) must use appropriate hand signal to inform spotter if there is a bad rope or rappel site. Spotter will assure that the descent devices are on the ground before sending next set of rappellers or de-rigging ropes.

X. Once rappellers move to a safe area spotter may repeat rappel process from step 5 as necessary.

Y. Once complete, spotter states to pilot, “De-rigging ropes”,

Z. Spotter states (“Right side/ Left Side) rope away”, ( “Right Side/Left Side) door shut”, repeat process for off side.

AA. Spotter states “clear to depart.”

BB. Pilot responds” clear to depart?”. Spotter states “affirmative clear to depart”.

CC. The spotter with concurrence from the pilot may initiate the internal cargo procedure at this time. Pilot may elect to maintain hover or circle until cargo is prepared. See cargo procedures (7.6.1.D).

DD. Radio returned to normal operational mode and flight following authority is informed that rappel operation has been completed. The helicopter shall remain in the area until rappellers have positive communication with dispatch, division, etc.

EE. Rigging ropes in flight

After the completion of the first mission and prior to landing, there may be a need to deploy additional rappellers at a different location. In this case ropes and descent devices must be rigged in flight. Remaining rappellers must perform visual check once the spotter completes the rigging process. Once complete, a thumbs up is exchanged.
5.4.3 **Rappel Sequence Light Helicopters**

A. Spotter / pilot communicate adequate rotor clearance, power assessments, and rappel spot status throughout the rappel sequence. Using pilot's perspective (left, right, forward, back, and up or down relative to altitude above the ground.)

B. Spotter states to pilot, “**Removing Seatbelts**,” then give signal to rappeller(s).

C. Spotter states to pilot, “**Ready to drop ropes. How’s the Power”**.

D. Pilot confirms power, if within limits; pilot responds to spotter “**power good, drop ropes**”.

E. Spotter gives “drop ropes” signal to both rappellers. Rappellers drops rope outside skid. Spotter ensures both ropes are free of knots and rope bag is on the ground. If the spotter identifies a knot or other problem on the rope, this must be communicated to the rappeller. The rappeller must acknowledge.

F. Spotter states to pilot, “**Rappellers to the skids**,”

G. Pilot responds “**Rappellers to skids**”

H. Spotter gives “Move into Position” hand signal to rappeller(s). Rappellers move to the skid, gets set, clears rope, returns focus on the spotter. If the rappeller identifies a knot or other problem on the rope, this must be communicated to the spotter. The spotter must acknowledge.

I. Spotter states to pilot, “**Ready to send rappellers, How’s the Power”**.

J. Pilot confirms power, if within limits; pilot responds to spotter “**power good, send rappellers**”.

K. Spotter responds “**Sending rappellers**” and gives “Begin Descent” signal to each rappeller.

L. Rappeller(s) unlock, transition over skid, and descend to the ground.

M. Spotter states to pilot, “**Rappeller off the skid… half way… on the ground.”**

N. After reaching the ground, rappeller(s) disconnect from rope(s), and move to a safe area.

O. Once complete, spotter states to pilot, “**De-rigging ropes**”,

P. Spotter states ("**Right side/ Left Side**) rope away"

Q. Spotter states “**clear to depart.”**

R. Pilot responds” **clear to depart?”**

S. Spotter states “**affirmative clear to depart”**.
T. The spotter with concurrence from the pilot may initiate the internal cargo procedure at this time. Pilot may elect to maintain hover or circle until cargo is prepared. See cargo procedures (7.6.1.D)

U. Radio returned to normal operational mode and flight following authority is informed that rappel operation has been completed. The helicopter shall remain in the area until rappellers have positive communication with dispatch, division, etc.

5.5 Post-Rappel

The Spotter will:
A. Secure loose items in the helicopter.
B. Check to see seat belts are fastened.
C. Establish radio contact with ground personnel and flight following
D. Determine status of rappeller(s) deployed.

5.5.1 Administrative
Complete necessary documentation, pertinent to the mission.

5.5.2 Post-rappel debriefing
A. Spotter/pilot will critique the mission, and or discuss problems that may have occurred.
B. Upon rappellers return, spotter and rappeller(s) will critique the mission.
5.6 Hand Signals

The following standard hand signals shall be used (order may change dependant on A/C type):

5.6.1 **Thumbs Up**: Used by rappellers and spotters to indicate, "I agree" or "I am O.K."

5.6.2 **Remove Seatbelt**: Imitate removing lap belt. Spotter gives signal to each rappeller.

5.6.3 **Drop Ropes**: With outstretched arm(s) and index finger pointing down, move arms in a downward motion. Signal given by spotter to rappeller(s) to drop ropes.

5.6.4 **Move Into Position**: Hands clasped at chest level with elbows out. Given by spotter to rappellers to signal move to pre-rappel position.
5.6.5 Begin Descent: Arm(s) extended with open palms down, sweeping downward motion. Signal given by spotter to rappeller(s), indicating rappeller(s) to unlock and begin rappel.

5.6.6 Spread Eagle: Arms and legs outstretched while looking up to establish eye contact with spotter. Signal given by rappeller to spotter to indicate that rappeller has locked-off and further descent is not possible.

5.6.7 Begin ETO: Horizontal arm wave with outstretched arm. Signal given by spotter to rappeller, after rappeller has given spread eagle signal, indicating that rappeller should tie-off and cut rope below him/her and prepare to be lifted out.
5.6.8 **Lift Out:** Upward motion with outstretched arms. Given by rappeller to spotter to indicate that rope below rappeller has been cut and rappeller is ready to be lifted up.

5.6.9 **Clear to Flyaway:** Both arms extended to front of body with palms together. Signal given by rappeller during lift out and fly away indicating that rappeller is clear of obstacles and pilot can begin forward flight.

5.6.10 **Bad Rope:** With one arm outstretched, slashing motion across outstretched arm with other arm. Signal given by rappeller to spotter to indicate there is something wrong with the rope and spotter should drop it.

5.6.11 **Discontinue Rappel:** Slashing motion across throat with one arm. Signal given by rappeller to spotter indicating bad rappel site, discontinue rappel.
5.6.12 **Stop, Hold Position:** Arm(s) extended toward signal recipient with fist clenched (palm toward recipient). Signal given normally by spotter to stop and hold rappeller in position prior to the “begin descent” signal.

5.6.13 **Knot:** Finger pointing down the rope. Signal by spotter or rappeller indicating a knot in a deployed rope. This signal must be acknowledged by a head nod.

5.6.14 **Return to Seat:** Give "Stop and Hold" signal [arm(s) extended, fist(s) clenched] then bring fists and elbows together [arms bent 90° and fist(s) in front of body]. Signal given by spotter to indicate rappeller(s) should return to seat and buckle seat belt.

5.6.15 **Communication lost:** Single clenched fist. This signal is given to the pilot to indicate that intercom communication has been lost.
6 Rappel Emergency Procedures

Emergency Procedures are defined as established methods prescribed to respond to a situation, serious in nature, developing suddenly or unexpectedly, and demanding immediate action.

6.1 Rappeller Emergency Procedures and Signals

6.1.1 Rappeller Emergency Tie-off procedure.

A. If during a rappel the rappeller encounters a problem that will hinder their progress to the ground, the rappeller will attempt to clear the problem. The rappeller may initiate a Lock-Off to facilitate using both hands to correct the problem. If a Lock-off has been initiated, and the rappeller still cannot resolve the problem, the rappeller will return their attention to the spotter and give the Spread-Eagle Signal. If the spotter gives the signal (horizontal arm wave), the rappeller will initiate an Emergency Tie-Off (ETO) and cut the rope below. If no ETO signal is given, the rappeller will be lowered to the ground.

B. Emergency Tie-Off (ETO) is a procedure completed after locking-off, to permanently secure the rappeller's position on the rope. Some situations when a tie-off may be required are:
   1. The rope becomes entangled, preventing the rappeller from descending or creates a hazard to the helicopter.
   2. The rappeller cannot descend because of pitch (sap) on the rope.
   3. A knot on the rope has become lodged in the descent device.
   4. The rappeller has a descent device malfunction.

C. When a problem occurs and the helicopter has insufficient clearance from obstacles to lower rappeller to ground or; there is a problem with rappel site/landing area; the spotter will signal the rappeller to begin the Emergency Tie-Off procedure.

D. The Tie-Off procedure is as follows:
   1. Bring running end of rappel rope through between the harness webbing and rappeller's body from right to left where the descent device is attached. Pull up three to four feet of slack to form a running loop.
   2. Bring loop up and over descent device in a clockwise direction going behind the rappel rope and form a half-hitch around the fixed-end (to helicopter) of rope. Pull half-hitch tight.
   3. Form another half-hitch on top of the first one. Pull tight. A 6 – 12 inch looped tail should remain.
4. Cut the running end of rope approximately four to six feet below the descent device.

5. After the rope has been cut, the rappeller gives the spotter the ‘Lift-Out’ Signal. This indicates to the spotter that the rope has been cut and that the helicopter should climb until the rappeller is clear of obstacles. After all obstacles have been cleared, the rappeller will indicate this with the ‘Clear to Flyaway Signal’. Then, the helicopter transports rappeller to a safe landing site. Upon arriving at a safe landing site, the rappeller is lowered to the ground.

6. Once on the ground the rappeller shall wait for slack in the rope preventing possible snap back toward helicopter rotors. Then remove raptor knife and cut the rappel rope above the half-hitches.

6.1.2 Rappeller in distress

A Emergency Descent Arrest

If the rappeller cannot control the rate of descent, rappeller should reach across body with left hand and grasp rope above right hand then use both hands for braking. A term referred to as “Double Braking.” The rappeller may also, in addition to Double Braking, move the brake hand around to the back of the body in an attempt to use the added friction of the clothing to assist braking.

A rappeller on the ground may slow the descent of a rappeller on a rope by pulling directly down on the rope. This procedure is called belaying.

B Problems After Rappel

For operations where multiple rappellers are deployed from a single rope, procedures are in place to allow the first rappellers to the ground to signal problem to the spotter.

1. If a rope defect or problem is evident, the rappeller(s) will give the Slash-Arm Signal to indicate to the spotter the rope is unsafe and it should be dropped and the mission completed with a new rope.

2. If a rappeller on the ground recognizes the rappel site is a safety problem, the rappeller will give the Slash-Across-Throat Signal to indicate to the spotter that site is unacceptable so the rope may be dropped and another location can be selected.
6.2 Helicopter Emergency

NOTE: There are many circumstances that can constitute an in-flight emergency. Pilots, spotters and rappellers must understand that the consequences of an emergency change significantly once rappellers are committed to the rope. It is extremely important for a pilot and spotter to have a firm understanding of the situation and discuss up front as many circumstances as possible prior to operations. In the midst of an emergency is NOT the place to discover that, “What you heard is not what I meant.” This should be accomplished through briefings and on-ground emergency exercises.

6.2.1 Emergency Communications

In the rappel environment, clear and concise communication culminating in a coordinated response between the spotter and pilot is critical to a successful outcome.

There are two basic categories of emergencies:
1. Those that require an immediate response.
2. Those that permit a delayed response.

6.2.2 Immediate Response Emergencies:

There are a limited number of emergencies that fall into this category. In the rappel environment these emergencies are characterized by a need to depart the rappel hover without delay. In this type of emergency, the possibility of affecting a positive outcome will be impacted by the ability to jettison ropes quickly.

Examples of Possible Emergencies:
- Engine Failure
- Tail Rotor Failure
- Hard over of controls
- Engine over speed/driveshaft failure
- Compressor Stall (Single engine)
- Governor Failure Low Side (Twin Engine)
- Governor Failure (Single Engine)

A. Challenge/Response Communications- Immediate Response Emergency

PILOT: “Cut, Cut, Cut”
SPOTTER:
1. If ropes have not been deployed:
   - state “Clear”
   - immediately take seat and buckle-up.

2. If ropes have been deployed, state “Cutting Ropes” and:
   a. If ropes have been deployed but rappellers are still in their seats:
      - cut ropes at the anchor below swedges,
      - state “Clear” when second rope has been cut
      - take seat and buckle-up.
   
   b. If rappellers seatbelts are removed:
      - Give rappellers signal to “return to seats”
      - Cut ropes below the descent device on either side as rappellers re-enter aircraft
      - State “Clear” when second rope has been cut
      - Take seat and buckle-up.
   
   c. If rappellers have departed the skid:
      - Confirm emergency
      - Cut ropes at the anchor below the swedges
      - State “Clear” when second rope has been cut
      - Take seat and buckle-up.

NOTE: The “Cut, Cut …” and the subsequent actions taken by the pilot and spotter will occur almost simultaneously. Pilot, will attempt to gain forward flight, if possible, which will require that the spotter clear ropes without hesitation. The pilot is not expected to wait for the “Clear” from the spotter before taking action to appropriately respond to the emergency. Any failure to immediately clear the aircraft of ropes may pose a threat to the aircraft and personnel onboard, as well as increase the risk to rappeller(s) on the rope(s).
6.2.3 Delayed Response Emergencies:

There are any numbers of events, typically mechanical or environmental, that fall into this category. In the rappel environment, these events are characterized by an ability to delay the departure from the rappel hover. In events of this nature there is typically time to complete a rappel sequence prior to departing the rappel hover.

**Caution:** These procedures may not require immediate action and responses can vary in time from seconds to minutes

Examples of Possible Problems:
- Transmission/Engine/Tail Rotor Gear Box Chip Light
- Hydraulic Failure
- Oil temp/Oil pressure light
- Hydraulic temp or pressure light
- Unknown Master Caution
- Fire light (require pilot check of controls and for fire on board)
- Stuck pedal
- Fuel control or governor failure high side (Twin Engine)
- Electrical failure
- Fuel/air filter clog
- Fuel pump failure
- Decrease in rotor RPM
- Compressor Stall (twin engine)
- Severe up or down drafts

A. Challenge/Response Communications - Delayed Response Emergency

1. Events of a **mechanical** nature require termination of the rappel mission until such problem(s) can be resolved. An event of this nature requires that the pilot announce the problem, describe the problem and inform the spotter of the actions required to address the event. The ensuing discussion between pilot and spotter will determine a course of action and the time available.

   a. If ropes *have not* been deployed:
      - Spotter states **“Clear”**
      - Immediately take seat and buckle-up.
      - Aircraft will depart immediately and comply with Pilot Operating Handbook (POH) direction.

   b. If ropes *have been* deployed and rappellers *have not* departed the skids:
      - The spotter will return rappellers to their seats
• Cut ropes freeing the aircraft for immediate departure and compliance with POH direction.

c. If you are in mid sequence (ropes deployed and rappellers departed the skids)
   • Continuation of the rappel is permissible if circumstances warrant.
   • Once the rappellers are on the ground the spotter will cut the ropes freeing the aircraft for immediate departure and compliance with POH direction

2. Events of an **environmental** nature may be resolved by waiting for the event to subside or relocating to an alternate rappel site. An event of this nature requires that the pilot inform the spotter of the actions required to address the event. **The ensuing discussion between pilot and spotter will determine a course of action and whether relocation is necessary.**

   a. If relocation is not required:
      • Once the pilot and spotter concur that the event is no longer of concern rappel operations can resume.

   b. If relocation is required:
      1. If ropes have not been deployed,
         • Spotter state “Clear”
         • Immediately take seat and buckle-up.
         • Aircraft will depart immediately and comply with Pilot Operating Handbook (POH) direction.
      2. If ropes have been deployed and rappellers have not departed the skids:
         • the spotter will return rappellers to their seats.
         • cut ropes freeing the aircraft for immediate departure and compliance with POH direction.
      3. If you are in mid sequence (ropes deployed and rappellers departed the skids):
         • Continuation of the rappel is permissible if circumstances warrant.
         • Once the rappellers are on the ground the spotter will cut the ropes freeing the aircraft for immediate departure and compliance with POH direction.
6.2.4 Loss of Inter-Cabin Communication:
In the event the pilot and/or the spotter become aware of a loss of inter-cabin communication the rappel process shall be suspended:

A. Spotter will signal to pilot loss of communication with a shoulder tap and presentation of a single clenched fist.

B. If ropes have not been deployed, rappel operations will be suspended. If the problem persists, signal pilot with a shoulder tap and thumbs up when ready to depart. The aircraft will proceed to a location where the problem can be resolved.

C. If ropes have been deployed and rappellers have not departed the skids, the spotter will return rappellers to their seats. If problem persists, ropes will be jettisoned, rappel operations will be terminated and then signal pilot with shoulder tap and thumbs up when ready to depart. The aircraft will proceed to a location where the problem can be resolved.

D. If ropes have been deployed and the rappellers have departed the skids, the rappellers will descend to the ground, rappel operations will be suspended. If problem persists the spotter will jettison the ropes and then signal pilot with a shoulder tap and thumbs up when ready to depart. The aircraft will proceed to a location where the problem can be resolved.
7  CARGO LETDOWN OPERATIONS

7.1  Introduction

"Helicopter cargo letdown" is defined as the deployment of cargo from a hovering helicopter by the means of an approved webbing, descent device, and auxiliary equipment.

The Helicopter Cargo Letdown Procedures consists of material compiled from the private sector, bureaus, and agencies within the Department of Interior and USDA Forest Service. This guide will allow the user to utilize helicopter cargo letdown to accomplish a wide variety of tasks or projects safely and economically. Cargo letdown was designed to augment helicopter rappel operations; it is not a replacement for long-line operations. Exposure and risk assessment must be addressed in the process of deciding which type of helicopter cargo delivery system to use.

7.2  Objectives

The intent of this guide is to develop standardization in training of individual spotters and pilots in a variety of helicopters for the safe and efficient deployment of cargo.

7.3  Utilization

7.3.1  Missions

Cargo-letdown expands the flexibility of the helicopter and crew and may enhance the safety of an operation. Cargo Letdown can be considered a resource when formulating response plans for a Bureau, Region, Forest, Park, etc.

7.3.2  Response

Initial response on an incident can be expedited where travel time by conventional methods is time intensive and arduous. Cargo Letdown can be utilized under a variety of terrain conditions which typically limit other access.
7.4 Qualifications

7.4.1 Pilot

Cargo-Letdown Pilots shall meet the same certification and proficiency requirements as a rappel pilot outlined in 2.1 of this guide. The only exception is any pilot carded only for cargo-letdown will perform a cargo sequence where rappel is referenced.

7.4.2 Cargo Letdown Check Spotter

A. Requirements and Qualification

1. Must have been a qualified spotter for two (2) years.
2. Must have assisted in training of at least two (2) cargo letdown spotters.

NOTE: New programs will be approved by National Aviation Offices for DOI or Forest Service.

B. Annual Check Spotter currency

Each cargo-letdown check spotter must maintain currency and proficiency as a cargo letdown spotter. (7.4.3 C & D)

C. Designation

Designation of Check Spotters shall be approved for model specific platforms annually by their Regional Helicopter Operations Specialist for Forest Service; by the National Aviation Office for BLM; by the Area Manager for BIA; or by the Regional Aviation Manager for NPS in the form of a designation letter. Other agencies and bureaus not listed above shall annually approve check spotters for their operations at a level in their organization commensurate with the positions above.

NOTE: If currency is lost during the annual qualification period, the check spotter must complete the proficiency requirements to remain current. Regional Helicopter Specialist must qualify check spotters annually.

7.4.3 Cargo Letdown Spotter

A. Cargo letdown Spotter Trainee Requirements

To be considered for spotter training, the trainee must meet the following requirements:
1. Completion of S-372 Helicopter Manager and initiate Helicopter Manager Taskbook.
2. Completion of National Incident Management System (NIMS) IS 700.
3. Other recommended training, Basic Supervision for First Line Supervisors, M-410 or equivalent, Contracting Officer Representative Level I, CRM, Risk Awareness (A-205) Ride along on rappel and or cargo missions.

B. Cargo-letdown Spotter Training and Qualification

Cargo-letdown spotter trainees must complete the following requirements to be considered for spotter certification.

1. Meet the training, experience and certification requirements for a Helicopter Manager as stated in their agency policy.
2. Demonstrate ability to rig helicopter and gear for cargo letdown operations.
3. Complete five (5) simulated deployments without procedural error. Perform all of the duties of the spotter from the initial call through return to base.
4. Under the supervision of a qualified spotter, must spot ten (10) loads from the helicopter, five (5) of which are in typical terrain.
5. Show principles of inspection, care, maintenance, and repair of cargo letdown equipment.
6. Identify the spotter's duties and responsibilities.
7. Pass a final evaluation administered by a qualified cargo-letdown or rappel check spotter.
8. The spotter trainee will be recommended for certification by a check spotter, reviewed by Regional Helicopter Operations Specialist for Forest Service; by the State Aviation Manager for BLM; by the Area Manager for BIA; or by the Regional Aviation Manager for NPS and certified by the local unit official. Other agencies and bureaus not listed above shall approve spotters for their operations at a level in their organization commensurate with the positions above.

NOTE: These are minimum requirements and the certifying official may request additional training due to the complexity of the expected operations, or an individual's needs for training in specific areas. If an individual cannot meet all of the above minimum requirements, the certifying official will not approve the spotter for cargo letdown operations.

C. Spotter Proficiency
Individuals shall make at least one cargo letdown spot every 14 days. If a helicopter letdown is not completed within 14 days, the spotter may use a simulation. If a simulation is used to maintain proficiency during the 14 day period, an airborne deployment must be done in the following 14 day period.

D. Annual Spotter certification

1. Must attend and successfully complete annual cargo letdown training.
2. Simulate a deployment without error.
3. Complete deployment of three loads of cargo without procedural error.
4. Demonstrate knowledge of standard procedures of cargo letdown.
5. Reference 4.1.2 for documentation requirements.

7.5 Cargo Deployment Equipment

7.5.1 Figure 8 with ears

For wildland fire rappel and cargo-letdown operations the steel or aluminum CMC rescue 8 with ears is the only approved letdown device. To rig: a loop of the line is passed through the center opening of the figure 8 and over the top. A technique referred to as a double wrap can be used for heavier loads. To perform a double wrap merely repeat original process.

A. Inspection:

1. Inspect for grooves developing or flaking occurring in aluminum figure 8's. When a groove develops beyond the anodized surface of the aluminum figure 8, wear will rapidly occur. If the groove is beyond 1/16-inch deep, retire the figure 8.

2. Inspect the figure 8 for aluminum flaking. This develops rough edges that could cause excessive wear on the line. If flaking is evident, remove the figure 8 from service. Although the acquisition cost is double, steel figure 8's have proven more durable and service life is considerably longer than aluminum, however, steel may cause heat damage more easily because it does not dissipate heat as readily as aluminum.

3. Inspect for cracks or breaks. If cracks are evident, retire figure 8.

4. Figure 8's must be inspected by a spotter prior to each use.

B. Take care to

1. Avoid rough handling.
2. Not drop or drag on ground.
7.5.2 Carabiners

Only the SMC Lite Alloy Steel Locking carabiner is authorized for cargo letdown use. (Exception: carabiners specifically identified by supplemental type certificate (STC) for direct attachment to anchor). Reference 3.5.1 for specific carabiner information.

**NOTE:** Carabiners are designed to be loaded longitudinally; if load occurs on the side(s), gate failure may occur.

7.5.3 Cargo Letdown Line

To maintain even wear and maximize each lines useful life, line ends will be rotated after each use. To track equipment use, each end shall be marked A or B.

Let-down lines are available in lengths of 250ft or 300 ft. Both let-down lines shall conform to Mil-W-5625K Webbing, Textile, Nylon, Tubular, ¾”. Webbing conforming to this standard has a minimum breaking strength of 2300lbs.

Let-down lines 250 feet in length will be of white tubular nylon webbing and conform to drawing #MTDC-983, let-down lines of 300ft will be of yellow tubular nylon webbing and conform to drawing #MTDC-983.

Accordion packs will be constructed as to easily identify a 250ft let-down line from a 300ft let-down line.Accordion packs for 250ft let-down lines will be constructed of white cotton duck cloth, and accordion packs for 300ft let-down lines will be made from white cotton duck cloth with yellow seam tape. To further identify accordion packs, 1 inch stencils will be used to mark the outside surface of accordion packs with the length of let-down line to be used with each size accordion pack. 250 ft Accordion Packs will conform to drawing #MTDC-974 and 300 ft Accordion Packs will conform to drawing number #MTDC-1037. Both lines will be packed in accordance with the Wildland Fire Helicopter Rappel Cargo Letdown Accordion Pack video produced by MTDC. Edge Protection may be necessary along helicopter door edge or helicopter skids to prevent abrasion of the line.

**250 foot line:** White ¾” tubular nylon webbing, dyed appropriately, with stenciled accordion pack.

**300 foot line:** Yellow ¾’ tubular nylon webbing, dyed appropriately, with stenciled accordion pack.

A. Inspection:

1. Let-down lines will be inspected for wear and burns after cargo deployment, and ends reversed for the next let-down sequence.
2 Inspect stitching and webbing for abrasion, wear, cuts, chemical contamination or other damage.

B. Marking:

A twenty five foot section from each end of the let-down lines shall be clearly marked in red and a ten foot section in the center of the line should be marked with a contrasting color. Use only Rit dye to mark lines.

7.5.4 Let Down Containers

Bags are to be manufactured with high strength abrasion-resistant materials. The attachment points on the bag must be reinforced to ensure there is not a failure during deployment. Sources for approved cargo letdown containers are also listed on the rappel website. Maximum allowable suspended weight per internal cargo let down container shall be 125 lbs. Approved cargo let down containers shall pass a static strength test with no failure or ruptured stitches when loaded to a minimum weight of 468.75 lbs. (safety factor of 3.75 to 1).

A Internal cargo letdown containers shall consist of the following:

1. Cardboard box with harness, the cardboard box shall consist of double wall construction with minimum burst strength of 275 lbs. The box harness and attachment hardware shall have minimum burst strength of 275 lbs. The box harness and attachment hardware shall have a minimum tensile strength of 1125 lbs.
3. Large Klamath Bag.

B External cargo letdown containers shall consist of the following:

1. Tuna Net (NFES #0795).
2. Large Klamath Bag.

The maximum weight and the minimum weight for the large and small Klamath bags will be stenciled on the container with 3 inch letters in a high contrast color. The limitations will be illustrated on opposing sides of the container.

NOTE: Maximum weight and minimum weight for external cargo deployment containers.

- Large Klamath Bag
  - Maximum Weight: 300 lbs.
  - Minimum Weight: 150 lbs.
7.5.5 **External Cargo Deployment (Break-away strap and Cargo Strap)**

For external cargo deployment the break-away strap which is the connecting line between the external load or cargo strap and cargo let down line shall conform to Mil-W-5625K and be 1" tubular nylon. The minimum breaking strength of 1" tubular is 4000 lbs. External cargo operations shall use the model specific Break Away and Cargo Straps manufactured in accordance with drawing # MTDC 980 Helicopter Rappel External Cargo Break Away strap and drawing # MTDC 982 Helicopter Rappel External Cargo Strap.

A. Inspection
   1. Equipment will be inspected prior to use by a qualified spotter.
   2. Inspect stitching and webbing for abrasion, wear, cuts, chemical contamination or other damage.

7.5.6 **Figure 8 Extender**

Relocates the Figure 8 away from an aircraft hardpoint. Figure 8 extender conforms to MTDC Drawing # 1040.

A. Inspection:
   1. Equipment will be inspected prior to use by a qualified spotter.
   2. Inspect stitching and webbing for abrasion, wear, cuts, chemical contamination or other damage.

7.5.7 **External Cargo Swivel**

All external cargo-letdown loads must be attached to the helicopter with an approved swivel.

The Petzl P58 S, P58 L and swivels approved for cargo in the IHOG.
are the approved swivels for external cargo letdown operations.

A. Inspection

1. Equipment will be inspected prior to use by a qualified spotter.
2. Spinning action of the swivel
3. Physical damage
4. Inspection criteria as outlined in chapter 9 of IHOG approved equipment.
7.6 **Standard Procedures**

All training and actual deployment missions will use the following steps and procedures. The intent is to standardize and maintain continuity between units.

7.6.1 **Internal cargo deployment procedures**

A. **Pre-Flight Duties for Cargo Only Missions**
   1. Prior to departure, the pilot(s) and involved personnel shall receive a briefing on mission objectives, communications, known hazards, and emergency procedures.
   2. Spotter puts on harness, ensures safety knife is attached to harness.
   3. Load calculations and manifests complete and posted.
   4. Spotter completes necessary pre-flight inspections.
   5. Prior to flight, the spotter must receive a spotter equipment check (see 5.3.9). When ground personnel are unavailable, the spotter shall have the pilot perform this check. Positive communication between the spotter and pilot must occur to ensure Spotter has attached their tether to an approved hard point.

B. **Rigging and Loading Cargo**
   1. Spotter will configure Helicopter to meet the needs of the specific cargo mission.
   2. Rig cargo with carabiner(s) and secure in helicopter. Cargo should be secured in accordance with model specific configurations in Appendix B.
   3. Check cargo delivery equipment to ensure proper number of letdown lines, extra carabiners, and figure 8 are available and secured in accessible location.
   4. Spotter visually inspects anchor. (See Chapter 3, Rappel Anchor Inspection)
   5. Spotter connects tether, plugs into avionics, boards aircraft, and secures seatbelt.

C. **Pre-Cargo Sequence**
   1. Pilot(s) flies a reconnaissance of the area to look for hazards and works with spotter to select an appropriate cargo delivery site.
   2. Contact appropriate flight following authority (ATGS, HLCO, dispatch, etc.) prior to commencing the cargo operation. Spotter communicates with flight following authority & pilot regarding number of loads to be deployed.
   3. Inform ground personnel to stay clear of cargo during deployment.
4. Adjust radios as needed to ensure pilot and spotter communication will not be compromised by excessive radio chatter. Radios must remain on and dialed to the appropriate flight following frequency.

5. Where possible helicopter should maintain at least 50ft. clearance above any obstacles before starting a cargo operation.

6. If this is not possible and helicopter must descend below the canopy, rotor clearance must meet the current standards in the IHOG.

7. Before starting cargo operations, A HOGE Power check is accomplished at an altitude comparable to the cargo site or greater. A Positive rate of climb must be established without exceeding aircraft limitations. Pilot states “hover established, positive rate of climb, power is good.”

8. Spotter responds "Power is Good"

9. Spotter activates hot mike if not done already

10. If not performed on the ground, spotter rigs Figure 8 with cargo letdown line and attaches figure 8 using one (1) carabiner in anchor bracket barrel down gate facing inboard. Attach end of letdown line to cargo with steel locking carabiner. Lock carabiner.

11. Cargo letdown pack must be connected to a hard point.

12. Spotter removes restraining straps from cargo, ensure remaining cargo is secure, and positions cargo in doorway. Spotter relays to pilot when rigging is complete.

13. Aircraft with sliding doors will follow the procedures in the following three bullets
   - Pilot states to spotter “below 40 knots moving into cargo delivery site.
   - Spotter states to pilot, “opening aircraft door(s).” Once spotter has opened aircraft door spotter states to pilot “reset master caution”.
   - Pilot responds “Master Caution Reset.”

14. Spotter finalizes proper position over cargo site. Using pilot’s perspective (left, right, forward, back, and up or down relative to altitude above the ground.)

D. Cargo Deployment Sequence
1. Spotter states to pilot, “Cargo ready. How is the power.”
2. Pilot “powers good send cargo”.
3. Spotter will communicate with pilot regarding adequate rotor clearance, power assessments, and cargo spot status throughout the cargo operation. Using pilot’s perspective (left, right, forward, back, and up or down relative to altitude above the ground).

4. Spotter states to pilot, “Sending Cargo” then eases cargo out the door, over the flight step and skid.

5. Begin lowering cargo with positive control of letdown line; do not allow un-arrested descent of cargo. Keep pilot informed of actions and progress of cargo descent:

- “Cargo out the door”
- “Cargo halfway down”
- “Cargo on the ground”

6. When cargo is on the ground, unhook figure 8 from carabiner/Anchor and remove letdown line. Hold slack in line to prevent billowing and unhook letdown line bag from hard point. Wrap excess letdown line around bag and throw clear of aircraft.

7. Inform pilot if more cargo is to be lowered. Pilot/spotter will determine whether to hold hover or orbit area until cargo is ready for subsequent deployment.

8. When cargo deployment is complete spotter states to pilot, “Lines are away, clear to depart.”

9. Pilot responds "lines away, clear to depart."

10. Spotter states “affirmative lines are clear, clear to depart.”

11. Spotter closes doors (if necessary), returns to seat and fastens seatbelt.

12. Radio returned to normal operational mode and flight following authority is informed that cargo operation has been completed.
### 7.6.2 External Cargo Deployment Procedures

#### A. Pre-Flight Duties For Cargo Only Missions.

1. Prior to departure, the pilot(s) and involved personnel shall receive a briefing on mission objectives, communications, known hazards, and emergency procedures.
2. Spotter puts on harness, ensures safety knife is attached to harness.
3. Load calculations and manifests complete and posted.
4. Spotter completes necessary pre-flight inspections.
5. Prior to flight, the spotter must receive a spotter equipment check (see 5.3.9). When ground personnel are unavailable, the spotter shall have the pilot perform this check. Positive communication between the spotter and pilot must occur to ensure Spotter has attached their tether to an approved hard point.

#### B. Rigging and Loading Cargo (see Appendix B for specific aircraft rigging and configuration)

1. Loaded cargo container is set up in the front of the helicopter.
2. Attach one end of the cargo strap to the cargo container and the other end to the swivel. Light weight nets (tuna) are attached directly to the swivel.
3. External cargo must be attached to the belly hook, with hardware that meets flight manual specs.
4. Spotter performs all appropriate hook checks, attaches single hard loop end of breakaway strap to the top end of the swivel hardware, and then connects swivel system and cargo to helicopter cargo hook.
5. Rig letdown line through figure 8 and attach a carabiner to the hard loop on the free end of the line.
6. Anchor
   - Overhead Anchor: Attach the steel-lite carabiner and the rigged figure 8 to the outer attachment point on the left side overhead anchor. Once complete, pull the free end of the line and carabiner down to the floor and attach to the Velcro loop on the breakaway strap. Spotter must secure the breakaway strap attached to the carabiner during flight.
   - Floor anchor: Attach the rigged figure 8 to the forward attach point on the left side of the floor anchor. Attach locking carabiner on rigged letdown line to the Velcro loop on the
breakaway strap. Extender strap may be used to move figure 8 away from the floor anchor.

7. Lock off letdown line on figure 8.
8. Cargo letdown pack must be connected to a appropriate hard point.

9. Spotter connects tether, plugs into avionics, completes necessary external cargo checks, boards aircraft, and secures seatbelt.
10. Spotter tells pilot, “Tether attached, load on the hook OK to depart,”
11. Pilot Responds “Tether attached, load on the hook, departing.”

C. Pre-Cargo Sequence

1. Pilot(s) flies a reconnaissance of the area to look for hazards and works with spotter to select an appropriate cargo delivery site.

2. Contact appropriate flight following authority (ATGS, HLCO, dispatch, etc.) prior to commencing the cargo operation. Spotter communicates with flight following authority & pilot regarding number of loads to be deployed.

3. Inform ground personnel to stay clear of cargo during deployment.

4. Adjust radios as needed to ensure pilot and spotter communication will not be compromised by excessive radio chatter. Radios must remain on and dialed to the appropriate flight following frequency.

5. Where possible helicopter should maintain at least 50ft. clearance above any obstacles before starting a cargo operation.

6. If this is not possible and helicopter must descend below the canopy, rotor clearance must meet the current standards in the IHOG.

7. Before starting cargo operations, A HOGE Power check is accomplished at an altitude comparable to the cargo site or greater. A Positive rate of climb must be established without exceeding aircraft limitations. Pilot states “hover established, positive rate of climb, power is good.”

8. Spotter responds “Power is Good”

9. Spotter activates hot mike if not done already

10. Spotter states to pilot “removing seatbelt” and “moving into position”.

11. Spotter attaches hard loop on the breakaway strap and ensures carabiner is locked. Spotter states to pilot “Cargo connected hard” Pilot confirms “Hooked Hard”
12. Spotter unlocks the figure 8 and ensures the carabiner is clear of the skid.
13. Spotter finalizes proper position over cargo site. Using pilot’s perspective (left, right, forward, back, and up or down relative to altitude above the ground.)

D. Cargo Deployment Sequence

1. Spotter will communicate with pilot regarding adequate rotor clearance, power assessments, and cargo spot status throughout the cargo operation. Using pilot’s perspective (left, right, forward, back, and up or down relative to altitude above the ground).
2. **Spotter states to pilot, “Cargo is ready for deployment on your count.”**
3. Pilot gives a three (3) count and releases cargo from belly hook.
4. Begin lowering cargo with positive control of letdown line; do not allow un-arrested descent of cargo. Keep pilot informed of actions and progress of cargo descent:
   - “Cargo away”
   - “Cargo halfway down”
   - “Cargo on the ground”
5. When cargo is on the ground, unhook figure 8 from carabiner/anchor and remove letdown line. Hold slack in line to prevent billowing and unhook letdown line bag from hard point. Wrap excess letdown line around bag and throw clear of aircraft.
6. When cargo deployment is complete **spotter states to pilot, “Lines are clear, returning to seat, seatbelt on, clear to depart.”**
7.7 Cargo Delivery Emergency Procedures: Internal Cargo

“Emergency procedures” are defined as the standard established procedures used to respond to a situation, serious in nature, developing suddenly or unexpectedly, and demanding immediate action. In the cargo delivery environment, clear and concise communication culminating in a coordinated response between the spotter and pilot is critical to a successful outcome.

Types of Helicopters Emergencies
There are two basic categories of emergencies:

1. Those that require an immediate response.
2. Those that permit a delayed response.

7.7.1 Immediate Response Emergencies:
There are a limited number of emergencies that fall into this category. In the cargo delivery environment these emergencies are characterized by a need to depart the hover without delay. In this type of emergency, the possibility of affecting a positive outcome will be impacted by the ability to jettison lines quickly.

Examples of Possible Emergencies:
- Engine Failure
- Tail Rotor Failure
- Hard over of controls
- Engine over speed/driveshaft failure
- Compressor Stall (Single engine)
- Governor Failure Low Side (Twin Engine)
- Governor Failure (Single Engine)

7.7.2 Challenge/Response Communications - Immediate Response Emergency

PILOT: “Cut, Cut, Cut”

SPOTTER:
A. If cargo is still secure:
   • state “Clear”
   • immediately take seat and fasten seatbelt
   • Aircraft will depart immediately and comply with Pilot Operating Handbook (POH) direction.

B. If the cargo process has begun and the cargo has been unsecured:
   • State “Clearing Cargo” and:
a. If cargo is still in the aircraft:
   • Re-secure cargo or Cut line directly above cargo container and Jettison cargo out open door.
   • State “Clear”
   • take seat and buckle-up.

b. If cargo has been delivered outside the aircraft:
   • Cut line
   • State “Clear” when the cargo container has cleared the aircraft
   • Take seat and buckle-up.

**NOTE:** The “Cut, Cut …” and the subsequent actions taken by the pilot and spotter will occur almost simultaneously. Pilot, will attempt to gain forward flight, if possible, which will require that the spotter clear cargo without hesitation. The pilot is not expected to wait for the “Clear” from the spotter before taking action to appropriately respond to the emergency. Any failure to immediately clear the aircraft of cargo and line may pose a threat to the aircraft and personnel onboard.

### 7.7.3 Delayed Response Emergencies:

There are any numbers of events, typically mechanical or environmental, that fall into this category. In the cargo delivery environment, these events are characterized by an ability to delay the departure from the hover. In events of this nature there is typically time to complete a cargo sequence prior to departing the hover.

**Caution:** These procedures may not require immediate action and responses can vary in time from seconds to minutes

**Examples of Possible Problems:**
- Transmission/Engine/Tail Rotor Gear Box Chip Light
- Hydraulic Failure
- Oil temp/Oil pressure light
- Hydraulic temp or pressure light
- Unknown Master Caution
- Fire light (require pilot check of controls and for fire on board)
- Stuck pedal
- Fuel control or governor failure high side (Twin Engine)
- Electrical failure
- Fuel/air filter clog
- Fuel pump failure
- Decrease in rotor RPM
- Compressor Stall (twin engine)
- Severe up or down drafts
7.7.4 Challenge/Response Communications - Delayed Response Emergency

Events of a mechanical nature require termination of the cargo mission until such problem(s) can be resolved. An event of this nature requires that the pilot announce the problem, describe the problem and inform the spotter of the actions required to address the event. The ensuing discussion between pilot and spotter will determine a course of action and the time available.

A. If cargo is still secure:
   • Spotter states “Clear”
   • Immediately take seat and buckle-up.
   • Aircraft will depart immediately and comply with Pilot Operating Handbook (POH) direction.

B. If cargo has been unsecured but not delivered outside the aircraft:
   • The spotter will state “Clear”
   • Secure the cargo as quickly as possible
   • Take seat and buckle seatbelt.

C. If you are in mid sequence (cargo has been delivered past the skids)
   • Continuation of the cargo delivery may be permissible if circumstances warrant.
   • Once cargo is on the ground the spotter will cut the line freeing the aircraft for immediate departure and compliance with POH direction

Events of an environmental nature may be resolved by waiting for the event to subside or relocating to an alternate cargo site. An event of this nature requires that the pilot inform the spotter of the actions required to address the event. The ensuing discussion between pilot and spotter will determine a course of action and whether relocation is necessary.

A. If relocation is not required:
   • Once the pilot and spotter concur that the event is no longer of concern cargo operations can resume.

B. If relocation is required:
   • If cargo is still secure:
     a. Spotter states “Clear”
     b. Immediately take seat and buckle-up.
c. Aircraft will depart immediately and comply with Pilot Operating Handbook (POH) direction.

- If cargo has been unsecured but not delivered outside the aircraft:
  a. The spotter will state “Clear”
  b. Secure the cargo as quickly as possible
  c. Take seat and buckle seatbelt.

- If you are in mid sequence (cargo has been delivered past the skids)
  a. Continuation of the cargo delivery may be permissible if circumstances warrant.
  b. Once cargo is on the ground the spotter will cut the line freeing the aircraft for immediate departure and compliance with POH direction
7.8 Cargo Delivery Emergency Procedures: External Cargo

“Emergency procedures” are defined as the standard established procedures used to respond to a situation, serious in nature, developing suddenly or unexpectedly, and demanding immediate action. In the cargo delivery environment, clear and concise communication culminating in a coordinated response between the spotter and pilot is critical to a successful outcome.

Types of Helicopters Emergencies
There are two basic categories of emergencies:

1. Those that require an immediate response.
2. Those that permit a delayed response.

7.8.1 Immediate Response Emergencies:
There are a limited number of emergencies that fall into this category. In the cargo delivery environment these emergencies are characterized by a need to depart the hover without delay. In this type of emergency, the possibility of affecting a positive outcome will be impacted by the ability to jettison lines quickly.

Examples of Possible Emergencies:
- Engine Failure
- Tail Rotor Failure
- Hard over of controls
- Engine over speed/driveshaft failure
- Compressor Stall (Single engine)
- Governor Failure Low Side (Twin Engine)
- Governor Failure (Single Engine)

7.8.2 Challenge/Response Communications - Immediate Response Emergency

A. Cargo still secure on the belly hook and cargo process has not yet commenced while aircraft is in a hover or in forward flight with breakaway strap hooked “Soft”.

PILOT: Declares emergency, while jettisoning external cargo from the aircraft.

SPOTTER:
- States “Clear”
- Immediately take seat and fasten seatbelt
B. If cargo process has started, break away strap is hooked “hard” w/ figure 8 locked off and cargo is still on the hook.

- State “Clearing Breakaway Strap”
- Cut letdown line below the figure 8
- State “Clear- Jettison Load”
- Immediately take seat and fasten seatbelt

C. If cargo process has started break away strap is hooked “hard” w/ figure 8 unlocked and cargo still on the belly hook

- State “Clearing Breakaway Strap”
- Cut letdown line below the figure 8
- State “Clear- Jettison Load”
- Immediately take seat and fasten seatbelt

D. If the cargo process has begun and the cargo has been released off the belly hook.

- Cut line below the figure 8
- State “Clear” when the let down line has cleared the aircraft
- Take seat and buckle-up.

**NOTE:** The “Cut, Cut …” and the subsequent actions taken by the pilot and spotter will occur almost simultaneously. Pilot, will attempt to gain forward flight, if possible, which will require that the spotter clear cargo without hesitation. The pilot is not expected to wait for the “Clear” from the spotter before taking action to appropriately respond to the emergency. Any failure to immediately clear the aircraft of cargo and line may pose a threat to the aircraft and personnel onboard

**7.8.3 Delayed Response Emergencies:**

There are any numbers of events, typically mechanical or environmental, that fall into this category. In the cargo delivery environment, these events are characterized by an ability to delay the departure from the hover. In events of this nature there is typically time to complete a cargo sequence prior to departing the hover.

**Caution:** These procedures may not require immediate action and responses can vary in time from seconds to minutes

**Examples of Possible Problems:**

- Transmission/Engine/Tail Rotor Gear Box Chip Light
- Hydraulic Failure
- Oil temp/Oil pressure light
Hydraulic temp or pressure light
Unknown Master Caution
Fire light (require pilot check of controls and for fire on board)
Stuck pedal
Fuel control or governor failure high side (Twin Engine)
Electrical failure
Fuel/air filter clog
Fuel pump failure
Decrease in rotor RPM
Compressor Stall (twin engine)
Severe up or down drafts

7.8.4 Challenge/Response Communications - Delayed Response Emergency

Events of a mechanical nature require termination of the cargo mission until such problem(s) can be resolved. An event of this nature requires that the pilot announce the problem, describe the problem and inform the spotter of the actions required to address the event. The ensuing discussion between pilot and spotter will determine a course of action and the time available.

A. Cargo still secure on the belly hook and cargo process has not yet commenced while aircraft is in a hover or in forward flight with breakaway strap hooked “Soft”.
   • Spotter states “Clear” Cargo can be jettisoned at pilot and spotters discretion
   • Immediately take seat and buckle-up.
   • Aircraft will depart immediately and comply with Pilot Operating Handbook (POH) direction.

B. If cargo process has started, break away strap is hooked “hard” w/ figure 8 locked off and cargo is still on the hook.
   • state “Clearing Breakaway Strap”
   • Disconnect Breakaway strap from carabineer cut letdown line below the figure 8
   • State “Clear- Jettison Load” at pilot and spotters discretion
   • Immediately take seat and fasten seatbelt

C. If cargo process has started break away strap is hooked “hard” w/ figure 8 unlocked and cargo still on the belly hook
   • state “Clearing Breakaway Strap”
   • Disconnect Breakaway strap from carabineer or cut letdown line below the figure 8
• State “Clear- “Jettison Load” at pilot and spotters discretion
• Immediately take seat and fasten seatbelt

D. If the cargo process has begun and the cargo has been released off the belly hook.
  • Continuation of the cargo delivery may be permissible if circumstances warrant.
  • Once cargo is on the ground the spotter will cut the line below the figure 8 freeing the aircraft for immediate departure and compliance with POH direction
  • State “Clear” when the let down line has cleared the aircraft
  • Take seat and buckle-up.

Events of an environmental nature may be resolved by waiting for the event to subside or relocating to an alternate cargo site. An event of this nature requires that the pilot inform the spotter of the actions required to address the event. The ensuing discussion between pilot and spotter will determine a course of action and whether relocation is necessary.

A. If relocation is not required:
   • Once the pilot and spotter concur that the event is no longer of concern cargo operations can resume.

B. If relocation is required:
   • If cargo is still secured on the belly hook:
     a. Spotter insures breakaway strap is hooked “Soft” if not spotter needs to ensure it is hooked “soft” before continuing.
     b. Spotter states “Clear”
     c. Immediately take seat and buckle-up.
     d. Aircraft will depart immediately and comply with Pilot Operating Handbook (POH) direction.
   • If you are in mid sequence (cargo has been released from the hook)
     a. Continuation of the cargo delivery may be permissible if circumstances warrant.
     b. Once cargo is on the ground the spotter will cut the line freeing the aircraft for immediate departure and compliance with POH direction.
New Base Start-Up Procedures

All proposed rappel and cargo letdown activities must be fully analyzed and supported by agency-approved planning analysis systems. After analyzing and justifying the feasibility of a program, the local District/Area Office shall request approval from the appropriate State/Regional Office. Permission for new base start up must be documented by an approval letter to the local unit listing any conditions and/or restrictions for the new program.
B.1 Bell 205/210/212/214B/412 Rappel/ Cargo Configuration

B.1.1 Aircraft Rappel Configuration

a. Remove right side of (5) persons forward facing seat.
b. Right side door post installed
c. Approved cargo netting installed around right well
d. Rappel cargo secured in right well with approved restraint system
e. Gunner straps installed with larks foot (one per person) at seatbelt ring: one (1) between first and third, two (2) between third and fourth and one (1) between second and fourth rappeller positions. Adjusted to prevent rappeller from extending past door opening.
f. Spotter tether attachment point installed in accordance with STC #SH261WE.
B.1.2 Spotter Anchor Inspection

a. Inspect overall condition for cracks or deformities
b. Ensure keeper pins are in place
c. Ensure overhead anchor hard points are tight and in good condition and safety wire is in place
d. Ensure support arms are tight and in good condition
e. Ensure door brackets are in installed and in good condition

Note: The helicopter contractor is required to inspect the anchor in accordance with the STC.

B.1.3 Rigging Anchor for Rappel Operations

a. Install Steel-Lite carabiners to overhead anchor hard points, barrels down, gates facing aft.

b. Snub strap shall be routed between anchor and ceiling.

c. Install Steel-Lite carabiners at forward slot of each door bracket barrel down, gate facing inboard. Install second Steel-Lite carabiner to upper carabiner barrel down, gate facing aft.
d. Thread each rope through the lowest carabiner on the door bracket. Then attach each rope end thimble to the carabiner on the overhead anchor. Lock the carabiners. Attach safety snub strap to rope(s) between first and second swage. Ensure both detent pins face to the right. Ensure rope protector protects the rope as it passes through the lowest carabiner on door bracket used.

e. For single rope operation, free end of snub strap will be secured to the carabiner on the off side of the rappel anchor.

f. Ropes may be pre-rigged with genies prior to installation in helicopter.

g. Spotter inspects all rappel rigging.
B.1.4 Helicopter Cargo Only Configuration and anchor rigging

a. Spotter will configure helicopter to meet the needs of the specific cargo mission.

b. Rig cargo with carabiner(s) and secure in helicopter. Cargo should be secured in either well behind approved cargo netting.

c. Check cargo delivery equipment to ensure proper number of letdown lines, extra carabiners, and figure 8’s are available and secured in accessible location.

d. Spotter rigs Figure 8 with cargo letdown line and attaches figure 8 using one (1) carabiner in rear slot of door bracket barrel down gate facing inboard. Attach end of letdown line to cargo with Steel-Lite carabiner. Lock carabiner.

e. Cargo letdown pack must be connected to a hard point.
B.2  Eurocopter AS-350 series (Astar)  Rappel/ Cargo Configuration

B.2.1  Aircraft Rappel Configuration
  a. Remove or secure all doors.
  b. Remove co-pilot seat.
  c. Install necessary sill plates
  d. Secure all loose items

B.2.2  Anchor Inspection
  Internal Floor Anchor STC: SR00125LA-D
  a. Inspect overall condition for cracks or deformities
  b. Ensure all bolts are in place and tight.
  Note: The helicopter contractor is required to inspect the anchor in accordance with the STC.

B.2.3  Rigging Anchor for Rappel Operations
  a. Internal Floor Anchor:
     I.  Install Steel-Lite carabiners on the aft attachment points.
     II. Set snub strap on floor by the anchor.

  b. External Overhead Anchor
     I.  For rope attachment, install Steel-Lite carabiners to the inner attachment point, gate facing forward, barrel lock down.
     II. For snub strap, install Steel-Lite carabiners to the aft attachment point, gate facing forward, barrel lock down. Attach snub strap soft loop to carabiner.

B.2.4  Helicopter Cargo Configuration and anchor rigging
  a. Remove or secure rear doors.
b. Install necessary sill plates

c. Remove co-pilot seat if necessary.

d. Secure all loose items.

e. Overhead Anchor: Attach the Steel-Lite carabiner and the rigged figure 8 to the outer attachment point on the left side overhead anchor. Once complete, pull the free end of the line and carabiner down to the floor and attach to the Velcro loop on the breakaway strap. Rappeller nearest the cargo rigging must secure the carabiner attached to the breakaway strap during flight.

f. Floor Anchor: Attach the rigged figure 8 to the forward attach point on the left side of the floor anchor. Attach locking carabiner on rigged letdown line to the Velcro loop on the breakaway strap. Extender strap may be used to move figure 8 away from the floor anchor.
B.3 Bell 407 Rappel/ Cargo Configuration

B.3.1 Aircraft Rappel Configuration
Configure Helicopter to meet specific needs of the particular mission.
   a. Remove or secure rear doors.
   b. Front doors and litter door may be removed at pilots and spotters discretion.
   c. Secure all loose items

B.3.2 Anchor Inspection
   a. Spotter visually inspects rappel anchor Inspect overall condition for cracks or deformities
   b. Ensure all bolts are in place and tight.
   c. Ensure approved carabineers are in place and function properly

Note: The helicopter contractor is required to inspect the anchor in accordance with the STC.

B.3.3 Rigging Anchor for Rappel Operations
   a. When utilized, attach cargo letdown line protective cradle to base plate and ensure keeper pin is in place (external cargo operations only.)
   b. Install both Aeronautical Accessories (AA) carabiners facing outward with barrel down to the overhead anchors.
   c. Attach snub strap soft loop to both AA carabiners with snub strap snap opening facing inboard.
   d. Attach the Steel-Lite carabiner outboard of snub strap soft loop with gate facing forward and barrel down to both AA carabiners.
**Critical:**
- The following must also be addressed to ensure CG limits are not exceeded: The right side rappeller shall be given the ‘unlock and rappel’ signal first. Once the right side rappeller has rotated over the skid, the left side rappeller may be given the signal to rappel.
- Once left side rappeller leaves the skid, spotter shall remain on left side of helicopter until both rappellers are on the ground.
- It should be recognized that even with the spotter remaining on the left side of the helicopter during a right side rappeller stuck on rope scenario, there are weight combinations that may put the helicopter out of CG. Such weight combinations must be avoided.
- Initiating a single person rappel from the right side is prohibited.
- Single person rappelling from the left side is permitted. However, the potential for exceeding lateral CG limits is possible depending upon weights of personnel and cargo.
- When possible, the lighter weight rappeller should be on the right side of the helicopter.

**B.3.4 Helicopter Cargo Configuration and anchor rigging**

When used for cargo only missions rig the anchor as follows.

- **a.** When utilized, attach cargo letdown line protective cradle to base plate and ensure keeper pin is in place (external cargo operations only.)
- **b.** Install both Aeronautical Accessories (AA) carabiners facing outward with barrel down to the overhead anchors.
- **c.** Attach the Steel-Lite carabiner with gate facing forward and barrel down to both AA carabiners.
B.4 Bell L4 Rappel/ Cargo Configuration

B.4.1 Aircraft Rappel Configuration
Configure helicopter to meet specific needs of the particular mission.

a. Remove or secure rear doors.

b. Front doors and litter door may be removed at pilots and spotters discretion.

c. Secure all loose items

B.4.2 Anchor Inspection
Spotter visually inspects rappel anchor

a. Internal Rappel Anchor:
   1. Spotter visually inspects rappel anchor Inspect overall condition for cracks or deformities
   2. Ensure all bolts are in place and tight

b. Overhead Cargo Bracket:
   1. Spotter visually inspects rappel anchor Inspect overall condition for cracks or deformities
   2. Ensure all bolts are in place and tight.
   3. Ensure approved carabiners are in place and function properly

Note: The helicopter contractor is required to inspect the anchor in accordance with the STC.

B.4.3 Rigging Anchor for Rappel Operations
Install Steel-Lite carabiners, gates facing forward, to the floor anchor devices.
B.4.4 Helicopter Cargo Configuration and anchor rigging

a. When utilized, attach cargo letdown line protective cradle to base plate and ensure keeper pin is in place (external cargo operations only.)

b. Install both Aeronautical Accessories (AA) carabiners facing outward with barrel down to the overhead anchors.

c. Attach the Steel-Lite carabiner with gate facing forward and barrel down to both AA carabiners.
B.5 MD 900/902 Explorer Rappel/ Cargo Configuration

B.5.1 Aircraft Rappel Configuration
   a. Configure helicopter for rappel operations
   b. Front doors may be removed at pilots and spotters discretion
   c. Install fifth cabin seat.
   d. Cargo secured in cabin to approved anchor
   e. Gunner straps installed (larks foot one (1) per person) on seat at seatbelt anchor point.
   f. Gunner straps adjusted to prevent rappeller from extending past door opening.
   g. Spotter anchor installed into floor.

B.5.2 Anchor Inspection
Spotter visually inspects rappel anchor
   a. Inspect overall condition for cracks or deformities
   b. Ensure all bolts are in place and tight

B.5.3 Rigging Anchor for Rappel Operations
   a. Install spotter attachment anchor to floor in appropriate location.
   b. Attach on Steel-Lite carabiner to rappel ring with gate facing inboard and barrel down for rappel rope per anchor. Attach an additional Steel-Lite carabiner to rappel ring with gate facing outboard and barrel down for safety snub strap.
   c. Attach rope to the carabiner on the overhead anchor.
   d. Attach safety snug strap to carabiner and then attach it to rope(s) between first and second swage. Ropes may be pre-rigged with genies prior to installation in helicopter.
Critical:
- Pilot must fly the helicopter from the right seat due to potential CG limitations.
- Single person rappelling is permitted only after a mission specific weight and balance calculation has been performed.

B.5.4 Helicopter Cargo Configuration and anchor rigging
   a. Spotter will configure helicopter to meet the needs of the specific cargo mission.
   b. Front doors may be removed at pilots and spotters discretion.
   c. Secure all loose items.
   d. Spotter oversees loading and securing of cargo and let-down equipment.
Appendix C. Forms

Equipment records and Rappeller/Spotter Unit Logs shall be documented in either hard copy forms provided below or in RAPREC. For initial certification and recertification documentation, the forms provided below will be completed and maintained. The following are forms to be used for rappel program documentation purposes. The forms will allow individual rappel programs to organize and document histories of equipment and training. They were designed to contain all of the pertinent information that has been described in detail in the Interagency Helicopter Rappel Guide.
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ID#: ___________  
Calendar Year: ___________

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Total:
BE. Descent Device Log

ID#: ____________  Date Put Into Service: ____________  Date Retired: ____________

Number of Prior Uses:

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BF. Rappel Rope Log

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### Individual Rappel Record – Initial Rappeller Training

**Rappel Crewmember Training Record**

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#### 1. Rappel Equipment Orientation and Use

The trainee will demonstrate proper use and care of equipment.

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<td>13. Gunner Strap</td>
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<td>14. Attentiveness to spotter</td>
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</table>

The trainee has demonstrated the proper use and care of rappel equipment. The trainee is ready to progress to Buddy Checks.

Instructor Signature | Instructor (print name) | Date
Refer to training elements in the Interagency Helicopter Rappel Guide, Appendix D, Lesson 3 – Buddy Checks.

2. Buddy Checks
The trainee will demonstrate proper donning of rappel equipment and proper Buddy Check.

<table>
<thead>
<tr>
<th>Task</th>
<th>Pass</th>
<th>Fail</th>
<th>Comments</th>
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</thead>
</table>
| Ensure trainee checks tactilely where appropriate (visor/mic boom/rappel gloves/harness/hardware/BD bag/knife).
| 1. Flight Helmet         |      |      |
| 2. Eye Protection        |      |      |
| 3. Nomex                 |      |      |
| 4. Rappel Gloves        |      |      |
| 5. Harness               |      |      |
| 6. BD Bag                |      |      |
| 7. Leg Straps            |      |      |
| 8. Knife                 |      |      |
| 9. Nomex & Boots         |      |      |
| 10. Back side (helmet/harness/nomex) | | |
| 11. Thumbs-up ("I agree, I am OK") |   | |
| 12. Rope/Device (aircraft specific) | | |

The trainee has demonstrated proper donning of rappel equipment and Buddy Checks. The trainee is ready to progress to Ground Training.

Instructor Signature:  | Instructor (Print Name):  | Date:  |
### Rappel Crewmember Training Record

**Initial Rappeller Training**

<table>
<thead>
<tr>
<th>Name:</th>
<th>Location</th>
<th>Date</th>
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</thead>
</table>

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Refer to training elements in the Interagency Helicopter Rappel Guide, Appendix D, Lesson 4 – Ground Training

#### 3. Ground Training

The trainee will demonstrate a basic relationship between rappel equipment, and proficiency in handling the decent device and rope and with lock off procedures.

<table>
<thead>
<tr>
<th>Task</th>
<th>Pass</th>
<th>Fail</th>
<th>Comments</th>
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<tbody>
<tr>
<td>1. Equipment Inspection</td>
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<tr>
<td>2. Equipment Care</td>
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<td>3. Identify Decent Device Parts</td>
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<td>4. Rigging of Decent Device</td>
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<td>5. Decent Device Orientation</td>
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<td>6. Hook-up</td>
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<td>7. Lock-Off</td>
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<td>8. Smooth Unlock</td>
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<td>9. Proper Hand Placement</td>
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<td>10. Head Position/ Visual</td>
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<td>11. Braking</td>
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<td>12. Smooth Un-hook</td>
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<td>14. Attentiveness to spotter</td>
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</table>

The trainee has demonstrated a basic relationship between rappel equipment, and proficiency in handling the decent device and rope and with lock off procedures. Trainee has demonstrated Emergency Procedures The trainee is ready to progress to Tower Training.

<table>
<thead>
<tr>
<th>Instructor Signature</th>
<th>Instructor (print name)</th>
<th>Date</th>
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</thead>
</table>
### 4. Tower Training

The trainee will demonstrate proficiency in exit from simulator. Demonstrate controlled descent. Perform 3 weighted re-entries. Perform 3 weighted knots. Perform 3 weighted Emergency Tie-Offs. Trainee will complete a minimum of 20 rappels between the High and Low Tower. A system of penalties is incorporated into rappel training starting at the tower (IHRG, Appendix D – performance based training).

If there is a deficiency in one of the areas below, it should be marked unsatisfactory (u) in the appropriate box and a comment made.

<table>
<thead>
<tr>
<th>Rappel #</th>
<th>Equipment Care</th>
<th>Buddy Check</th>
<th>Spotters' Check</th>
<th>Rigging Inspection</th>
<th>Gunner Strap</th>
<th>Response to Spotters' Signals</th>
<th>Orient Descent Device</th>
<th>Hook up/Lock-off</th>
<th>Transition to Skid</th>
<th>Clearing of Rope</th>
<th>Unlock</th>
<th>Exit Off Skid</th>
<th>Situational Awareness</th>
<th>Speed Control</th>
<th>Braking</th>
<th>Landing</th>
<th>Clearing of LZ</th>
<th>Weighted Reentry</th>
<th>Knot</th>
<th>Tie-Off</th>
<th>No Errors</th>
<th>Comments:</th>
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**Minors:** 1 2 3 4 5 6 7 8 9

**Majors:** 1 2 3

The trainee has demonstrated proficiency in exiting from the simulator and controlled descent. Performed 3 weighted reentries, 3 weighted knots and 3 weighted Emergency Tie-Offs. Completed a minimum of 20 rappels between the High and Low Towers. The trainee is ready to progress to Helicopter mock-ups.

_Instructor Signature_  
Instructor (print name)  
_Date_
Refer to training elements in the Interagency Helicopter Rappel Guide, Appendix D, Lesson 8 – Helicopter Mock-up’s

5. **Mock-Ups**
   Familiarize the trainee with the procedures in the helicopter to be used. Demonstrate ability to go through mock-up procedures without hesitation and or error. A system of penalties is incorporated into rappel training starting at the tower (IHRG, Appendix D – performance based training).

If there is a deficiency in one of the areas below, it should be marked unsatisfactory (u) in the appropriate box and a comment made.

| Rappel # | Equipment Care | Buddy Check | Spotter Check | Rigging Inspection | Seatbelts/Gunner Strap | Response to Spotter Signals | Orient descent | Hook up / Lock-off | Transition to Skid | Clearing of rope | Unlock | Exit Off Skid | Re-Entry | No Errors | Comments |
|----------|----------------|-------------|---------------|--------------------|------------------------|---------------------------|----------------|------------------|------------------|----------------|---------|-------------|---------|----------|
| 1.       |                |             |               |                    |                        |                           |                 |                  |                  |                |         |             |         |          |          |
| 2.       |                |             |               |                    |                        |                           |                 |                  |                  |                |         |             |         |          |          |
| 3.       |                |             |               |                    |                        |                           |                 |                  |                  |                |         |             |         |          |          |
| 4.       |                |             |               |                    |                        |                           |                 |                  |                  |                |         |             |         |          |          |
| 5.       |                |             |               |                    |                        |                           |                 |                  |                  |                |         |             |         |          |          |
| 6.       |                |             |               |                    |                        |                           |                 |                  |                  |                |         |             |         |          |          |
| 7.       |                |             |               |                    |                        |                           |                 |                  |                  |                |         |             |         |          |          |
| 8.       |                |             |               |                    |                        |                           |                 |                  |                  |                |         |             |         |          |          |
| 9.       |                |             |               |                    |                        |                           |                 |                  |                  |                |         |             |         |          |          |
| 10.      |                |             |               |                    |                        |                           |                 |                  |                  |                |         |             |         |          |          |
| 11.      |                |             |               |                    |                        |                           |                 |                  |                  |                |         |             |         |          |          |
| 12.      |                |             |               |                    |                        |                           |                 |                  |                  |                |         |             |         |          |          |
| 13.      |                |             |               |                    |                        |                           |                 |                  |                  |                |         |             |         |          |          |
| 14.      |                |             |               |                    |                        |                           |                 |                  |                  |                |         |             |         |          |          |
| 15.      |                |             |               |                    |                        |                           |                 |                  |                  |                |         |             |         |          |          |
| 16.      |                |             |               |                    |                        |                           |                 |                  |                  |                |         |             |         |          |          |

***Minors: 1 2 3 4 5 6 7 8 9
d****Majors: 1 2 3

The trainee is familiarized with the procedures in the helicopter to be used. Demonstrated the ability to go through mock-up procedures without hesitation and or error. The trainee is ready to progress to Live Rappels

<table>
<thead>
<tr>
<th>Instructor Signature</th>
<th>Instructor (print name)</th>
<th>Make/Model</th>
<th>Date</th>
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### 6. Live Helicopter Rappel Training

Trainee will demonstrate the ability to exit hovering helicopter safely and efficiently. When exposed to different rappel problems or terrain, the trainee is able to complete rappel or corrective procedure without hesitation or error.

***All penalties (minor/major) reset for Live Rappels, during live rappels, one major or three minors will be grounds for the candidate’s immediate removal from training. When a penalty is given by a spotter, mark the appropriate minor/major box below. 3 minors constitute a major.***

If there is a deficiency in one of the areas below, it should be marked unsatisfactory (u) in the appropriate box and a comment made.

<table>
<thead>
<tr>
<th>Rappel #</th>
<th>Equipment Care</th>
<th>Buddy Check</th>
<th>Spotter Check</th>
<th>Rigging Inspection</th>
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<th>Clearing of Rope</th>
<th>Unlock</th>
<th>Exit off Skid</th>
<th>Situational Awareness</th>
<th>Speed Control</th>
<th>Braking</th>
<th>Landing</th>
<th>Clearing of LZ</th>
<th>No Error **</th>
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***Minors: 1 2 3 ***

Trainee has demonstrated the ability to exit hovering helicopter safely and efficiently. When exposed to different rappel problems or terrain, the trainee is able to complete rappel or corrective procedure without hesitation or error.

**Instructor Signature**

**Instructor (print name)**

**Make/Model**

**Date**
**Individual Rappel Record – Returning Rappeller Training**

<table>
<thead>
<tr>
<th>Rappel Crewmember Training Record</th>
<th>Returning Rappeller Training</th>
<th>Page 1</th>
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<tbody>
<tr>
<td><strong>Name:</strong></td>
<td><strong>Location</strong></td>
<td><strong>Date</strong></td>
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<tr>
<td><strong>1.  Rappeller has completed Equipment and Procedures Review</strong></td>
<td><strong>Instructor</strong></td>
<td><strong>Date</strong></td>
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<tr>
<td>Refer to training elements in the Interagency Helicopter Guide, Chapter 2 – Annual Certification</td>
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</table>

**2. Tower Training**
The rappeller will demonstrate proficiency in exit from simulator. Demonstrate controlled descent. Perform 3 weighted re-entries. Perform 3 weighted knots. Perform 3 weighted Emergency Tie-Offs. Rappeller shall complete tower work as stated in the Interagency Helicopter Rappel Guide, Chapter 2 – Annual Certification (performance based requirements)
A system of penalties is incorporated into annual rappel certification starting at the tower (IHRG, Appendix D – performance based training).

<table>
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<th>Rappel #</th>
<th>Equipment Care</th>
<th>Buddy Check</th>
<th>Spotter Check</th>
<th>Rigging Inspection</th>
<th>Seatbelts/Gunner Strap</th>
<th>Response to Spotter Signals</th>
<th>Orient Descend Device</th>
<th>Hook-up/Lock-off</th>
<th>Transition to Skid</th>
<th>Clearing of Rope</th>
<th>Unlock</th>
<th>Exit Off Skid</th>
<th>Situational Awareness</th>
<th>Speed Control</th>
<th>Braking</th>
<th>Landing</th>
<th>Clearing of LZ</th>
<th>Weighted Reentry</th>
<th>Knot</th>
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<th>No Errors *</th>
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| Minors: 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Majors: 1 | 2 | 3 |

*If no boxes are marked unsatisfactory, place an “x” in the no errors box.
Unsatisfactory items must be addressed by a spotter.
Penalties (major/minor) will not be applied until after the 2nd tower rappel. 3 minors constitute a major.

The rappeller has demonstrated proficiency in exiting from the simulator and controlled descent. Performed 3 weighted re-entries, 3 weighted knots and 3 weighted Emergency Tie-Offs.
The Rappeller is ready to progress to mock-ups.

**Instructor Signature**

**Instructor (print name)**

**Date**
### 3. Mock-Ups

Familiarize the Rappeller with the procedures in the helicopter to be used. Demonstrate ability to go through mock-up procedures without hesitation and or error.

A system of penalties is incorporated into annual rappel certification starting at the tower (IHRG, Appendix D – performance based training).

If there is a deficiency in one of the areas below, it should be marked unsatisfactory (u) in the appropriate box and a comment made.

<table>
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<tr>
<th>Rappel #</th>
<th>Equipment Care</th>
<th>Buddy Check</th>
<th>Spotter Check</th>
<th>Rigging Inspection</th>
<th>Seatbelts/Gunner Strap</th>
<th>Response to Spotter Signals</th>
<th>Orient descent Device</th>
<th>Hook up/Lock-off</th>
<th>Transition to Skid</th>
<th>Clearing of rope</th>
<th>Unlock</th>
<th>Exit Off Skid</th>
<th>Re-Entry</th>
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**Minor:** 1 2 3 4 5 6 7 8 9  

**Major:** 1 2 3

The rappeller is familiar with the procedures in the helicopter to be used. Demonstrated the ability to go through mock-up procedures without hesitation and or error. The rappeller is ready to progress to Live Rappels.

Instructor Signature  
Instructor (print name)  
Make/Model  
Date

Instructor Signature  
Instructor (print name)  
Make/Model  
Date
4. Live Helicopter Rappel Training

Rappeller will demonstrate the ability to exit hovering helicopter safely and efficiently. When exposed to different rappel problems or terrain, the rappeller is able to complete rappel or corrective procedure without hesitation or error. Refer to training elements in the Interagency Helicopter Guide, Chapter 2 – Annual Certification.

***All penalties (minor/major) reset for Live Rappels, during live rappels, one major or three minors will be grounds for the rappeller’s immediate removal from training. When a penalty is given by a spotter, mark the appropriate minor/major box below. 3 minors constitute a major.

If there is a deficiency in one of the areas below, it should be marked unsatisfactory (u) in the appropriate box and a comment made.

<table>
<thead>
<tr>
<th>Rappel #</th>
<th>Indicate below rappel height and terrain.</th>
<th>Equipment Care</th>
<th>Buddy Check</th>
<th>Spotter Check</th>
<th>Rigging Inspection</th>
<th>Seatbelts/Gunner Strap</th>
<th>Response to Spotter Signals</th>
<th>Orientation Device</th>
<th>Hook up/lock-off</th>
<th>Transition to Skid</th>
<th>Clearing of Rope</th>
<th>Unlock</th>
<th>Exit off Skid</th>
<th>Clearing of LZ</th>
<th>No Error **</th>
<th>Comments</th>
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***Minors: 1 2 3

***Majors: 1

Rappeller has demonstrated the ability to exit hovering helicopter safely and efficiently. When exposed to different rappel problems or terrain, the trainee is able to complete rappel or corrective procedure without hesitation or error.

Instructor Signature

Instructor (print name)

Make/Model

Date

Instructor Signature

Instructor (print name)

Make/Model

Date
## Individual Rappel Record - Returning Spotter Training

### Spotter Annual Recertification Record

<table>
<thead>
<tr>
<th>Name</th>
<th>Location</th>
<th>Date</th>
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</table>

### Returning Spotter Task List:

Spotter must be evaluated by a qualified spotter in each make and model of helicopter that will be utilized as an operating platform. Spotter evaluators must be current in the make and model of helicopter being utilized.

1. Meet fitness standards
2. Attend and/or participate as an instructor at annual helicopter rappel training. This shall include re-qualifying as a rappeller
3. Attend RT-271 Helicopter Safety Refresher
4. Demonstrate Knowledge of Rappel Spotter Principals including emergency procedures, mission planning, and hazards.
5. Complete deployment of three loads of Rappellers with cargo from helicopter to the satisfaction of a qualified spotter with experience in make and model being used. **Typical terrain shall be utilized for at least one of the three loads.**

| Returning Spotter has met the above standards |
| Instructor | Date |

### 1. High Tower Training for Returning Spotter

Demonstrate proficiency in the simulator.

<table>
<thead>
<tr>
<th>Spot #</th>
<th>Tower Rigging</th>
<th>Rappeller equipment check</th>
<th>Seating arrangement for Rappellers and spotter</th>
<th>Rappel anchor, and equipment check</th>
<th>Pre-Lift off Procedures</th>
<th>In-Flight Procedures</th>
<th>Hand signals, exit procedures, sequence</th>
<th>Emergency procedures</th>
<th>ETO Sequence</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
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</table>

Returning Spotter has demonstrated proficiency in spotting from the simulator. The returning Spotter is ready to progress to mockups.

Instructor Signature Date:
### 2. Mock-Ups for Returning Spotter

Re-Familiarize the Returning Spotter with the procedures in the helicopter to be used. Demonstrate ability to go through mock-up procedures without hesitation or error.

<table>
<thead>
<tr>
<th>Mock-up #</th>
<th>Helicopter Rigging</th>
<th>Rappeller equipment check</th>
<th>Boarding</th>
<th>Rappel anchor, and equipment</th>
<th>Pre Lift off</th>
<th>In Flight Procedures</th>
<th>Hand signals, exit procedures</th>
<th>Cargo rigging and deployment</th>
<th>Emergency procedures</th>
<th>Communications w/ pilot or</th>
<th>Comments</th>
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<tbody>
<tr>
<td>1.</td>
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</tbody>
</table>

Returning Spotter is familiarized with the procedures in the helicopter to be used. Demonstrated ability to go through mock-up procedures without hesitation and or error. The Returning Spotter is ready to progress to live rappels.

Instructor Signature | Make/Model | Date
Instructor Signature | Make/Model | Date
Instructor Signature | Make/Model | Date

Comments
3. **Live Helicopter Rappels for Returning Spotter**

Returning Spotter will complete 3 rappels with cargo without procedural error. At least one of the rappels will be in typical terrain.

<table>
<thead>
<tr>
<th>Rappel #</th>
<th>Briefing w/ Pilot mission planning</th>
<th>Review Load calculations to include W&amp;B</th>
<th>Prepare helicopter for mission</th>
<th>Rappeller Riggng</th>
<th>Boarding sequence</th>
<th>Rappel anchor, and equipment check</th>
<th>Pre Lift off Procedures</th>
<th>In Flight Procedures</th>
<th>Hand signals, exit procedures, sequence</th>
<th>Cargo rigging and **</th>
<th>Communications w/ pilot</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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</tbody>
</table>

Returning Spotter is Recertified to be a Fully Qualified Helicopter Spotter

<table>
<thead>
<tr>
<th>Instructor Signature</th>
<th>Make/Model</th>
<th>Date</th>
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<tbody>
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</tbody>
</table>

Comments

<table>
<thead>
<tr>
<th>Instructor Signature</th>
<th>Make/Model</th>
<th>Date</th>
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</tbody>
</table>
Qualification Record
(N9046)

Assigned to:

____________________________________
Trainee’s Name                      Duty Station                      Phone Number

Initiated by:

____________________________________
Official’s Name & Title             Duty Station                      Phone Number

____________________________________
Make and Models

____________________________________
Helicopter Rappel Check Spotter or Agency Equivalent                      Date
Qualification Record for Helicopter Rappel Spotter

Instructions for Completing Qualification Records

Each requirement or task for each qualification record shall be signed and dated by the evaluating spotter. Comments should be included in the space provided to ensure appropriate documentation of performance and to provide feedback to trainees. Each requirement of the Spotter Trainee Qualification Record should only be signed off once the trainee demonstrates adequate knowledge and understanding of the standards or receives the appropriate training.

The evaluating spotter should also indicate under what performance code the spotter trainee completed the task. Task can be completed in a variety of situations per the following requirements.

- **T**=Perform during training, simulator, and mock-up operations
- **P**=Perform during training, proficiency, or project operations with helicopter
- **W**=Perform during wildfire or incident operations with helicopter

Tasks do not need to be completed in sequential order, but must be completed to the indicated standard.

The Spotter Trainee should be evaluated on multiple occasions and by more than one evaluator. The number of evaluations of each task is not limited to the number of signature lines provided within the Evaluator/Date column.

Spotter Re-Certification

Spotters must have documentation on all past qualifications. Inability to produce this documentation will result in starting over as a Spotter Trainee

Spotter Trainee Re-Certification

Spotter Trainees must have documentation on the completion of tasks. Inability to produce this documentation will result in starting over as a Spotter Trainee. If no documentation is available a qualified check spotter will evaluate the spotter trainee and make a determination as to what tasks the trainee can show completed.

Direct Supervision

Direct supervision is defined as qualified spotter presence onboard the helicopter during the rappel operation. The spotter may be a rappeller if the trainee has shown competency as a spotter trainee.

Indirect Supervision

Indirect supervision is defined as a qualified Helicopter Rappel Spotter (HERS) at the base of operation for the departure and return of the helicopter, not onboard the helicopter.
Helicopter Rappel Spotter

Upon finalization of the Spotter Qualification Record and successful completion of the Final Evaluation, the individual will be recommended for certification by a check spotter as a HERS to the local unit certifying official. This is a fully certified spotter qualification without limitation.

Re-Evaluation

Any task performed in the Final Evaluation rated as Fail shall require a period of further training followed by a re-evaluation. Task marked as fail shall be documented in the notes section with additional training requirements. Trainee will be re-evaluated on all demonstrated competencies not just those marked as fail. Once all tasks have been rated as Pass, the trainee may then be recommended for full qualification.

Position: Helicopter Rappel Spotter Trainee

<table>
<thead>
<tr>
<th>Pre-Requisites</th>
<th>Completed Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>One Year Helicopter Rappelling</td>
<td></td>
</tr>
<tr>
<td>Completion of S-372</td>
<td></td>
</tr>
<tr>
<td>Initiated HMGB Taskbook</td>
<td></td>
</tr>
<tr>
<td>Completion of 20 Live Helicopter Rappels</td>
<td></td>
</tr>
<tr>
<td>IS-700</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Recommended Training</th>
<th>Completed Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Supervision for First Line Supervisors</td>
<td></td>
</tr>
<tr>
<td>M-410 or equivalent</td>
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<tr>
<td>COR Level 1</td>
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<tr>
<td>CRM</td>
<td></td>
</tr>
<tr>
<td>Risk Awareness (A-205)</td>
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<tr>
<td>Ride along on rappel and/or cargo missions</td>
<td></td>
</tr>
</tbody>
</table>
Qualification Record

Task one (1) thru six (6) will be conducted under the direct supervision of a qualified Helicopter Rappel Spotter.

<table>
<thead>
<tr>
<th>Task 1</th>
<th>Evaluator /Date</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground School Code: T</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lead and assist spotter during instructional phase of rappel training as per rappel guide.</td>
<td></td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Task 2</th>
<th>Evaluator /Date</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tower/Simulator Code: T</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Give Tower and simulator briefing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cabin configuration (Model Specific)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proper Equipment Checks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verbalization with Pilot/Trainer (Emergency Procedures)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deploy Rappellers Using proper hand signals/procedures</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emergency Procedures</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cargo Configuration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cargo Equipment Orientation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task 2 (Continued)</td>
<td>Evaluator /Date</td>
<td>Comments</td>
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</tr>
<tr>
<td><strong>Tower/Simulator Code: T</strong></td>
<td></td>
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<tr>
<td>Cargo Equipment Checks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rigging and Deploying Cargo</td>
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</tr>
<tr>
<td>Complete 20 rappel cycles from the high tower, five (5) consecutive loads without procedural error with cargo.</td>
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<table>
<thead>
<tr>
<th>Task 3</th>
<th>Evaluator /Date</th>
<th>Comments</th>
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</thead>
<tbody>
<tr>
<td><strong>Communications, Size Up, Risk Management, with direct Supervision Code: W (Fire/Incident)</strong></td>
<td></td>
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<tr>
<td>Flight follow with appropriate authorities.</td>
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<tr>
<td>Maintain flight navigation.</td>
<td></td>
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<tr>
<td>Establish communications and coordinate, with IA resources.</td>
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<tr>
<td>Identify flight hazards.</td>
<td></td>
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<tr>
<td>Provide fire size-up to appropriate authority.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identify escape routes and safety zones</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identify rappel or landing site and alternate sites.</td>
<td></td>
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<td>---------------------------------------------------</td>
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<tr>
<td>Assess helicopter performance capabilities.</td>
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</table>

<table>
<thead>
<tr>
<th><strong>Task 3 (Continued)</strong></th>
<th><strong>Evaluator /Date</strong></th>
<th><strong>Comments</strong></th>
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<tbody>
<tr>
<td><strong>Communications, Size Up, Risk Management, with direct Supervision Code: W (Fire/Incident)</strong></td>
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<tr>
<td>Establish communications with rappellers and provides further LCES Information</td>
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<thead>
<tr>
<th><strong>Task 4</strong></th>
<th><strong>Evaluator /Date</strong></th>
<th><strong>Comments</strong></th>
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</thead>
<tbody>
<tr>
<td><strong>Mock-up Rappellers and Cargo Code: T/P</strong></td>
<td></td>
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</tr>
<tr>
<td>Proper briefing crew/pilot.</td>
<td></td>
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<tr>
<td>Proper configuration of cargo (model specific.)</td>
<td></td>
<td></td>
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<tr>
<td>Proper checks on cargo.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proper rappel configuration (model specific.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Re-configure helicopter for multiple sticks of rappellers (model specific)</td>
<td></td>
<td></td>
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<tr>
<td>Proper verbalization.</td>
<td></td>
<td></td>
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<tr>
<td>Proper signals</td>
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</table>

Emergency Procedures
Complete minimum of eight (8) cycles without procedural error.

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<thead>
<tr>
<th>Task 5</th>
<th>Evaluator /Date</th>
<th>Comments</th>
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</thead>
<tbody>
<tr>
<td>Live spotting of cargo under direct supervision of a rappel spotter Code: P/W</td>
<td></td>
<td>Make sure to enter Spot-on Tracking Sheet</td>
</tr>
<tr>
<td>Proper briefing crew/pilot.</td>
<td></td>
<td></td>
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<tr>
<td>Proper configuration (model specific.)</td>
<td></td>
<td></td>
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<tr>
<td>Proper equipment checks.</td>
<td></td>
<td></td>
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<tr>
<td>Proper verbalization.</td>
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<tr>
<td>Ensure OGE Power Check is completed.</td>
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<tr>
<td>Select adequate cargo site.</td>
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<tr>
<td>Maintain helicopter and rotor clearance throughout cargo letdown sequence.</td>
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<tr>
<td>Maintain visual on cargo</td>
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<tr>
<td>Maintain focus and control of mission.</td>
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<tr>
<td>Complete a minimum of ten (10) cycles without procedural error at low, medium and high heights. Five (5) in typical terrains.</td>
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</table>
The items in this task can be completed concurrently with Task 6.

<table>
<thead>
<tr>
<th>Task 6</th>
<th>Evaluator /Date</th>
<th>Comments</th>
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</thead>
<tbody>
<tr>
<td>Live spotting of rappellers under direct supervision of a rappel spotter Code: P/W</td>
<td>Make sure to enter Spot-on Tracking Sheet</td>
<td></td>
</tr>
<tr>
<td>Proper configuration (model specific.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proper briefing crew/pilot.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proper equipment checks.</td>
<td></td>
<td></td>
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<tr>
<td>Proper verbalization.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proper hand signals.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ensure OGE Power Check completed.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Select adequate rappel/cargo and alternative site.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maintain helicopter and rotor clearance throughout rappel/cargo sequence.</td>
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<tr>
<td>Maintain visual on ropes, rappellers, and cargo.</td>
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</tr>
<tr>
<td>Re-configure helicopter in flight between deliveries of multiple sticks of rappellers (model specific)</td>
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<tr>
<td>Maintain focus and control of mission.</td>
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</table>
Complete a minimum of ten (10) live cycles without procedural error. Five (5) typical terrain, three (3) with cargo, and one (1) emergency tie off.

Once spotter trainee has completed Tasks 1-6, demonstrating understanding and competence in all aspects of tower, mock-up, cargo delivery, and rappeller delivery procedures, supervisor and check spotter shall authorize trainee to conduct live spotting of cargo and rappellers under indirect supervision.

Spotting may occur during proficiency and fire/incident operations.

Authorization to spot under indirect supervision is conditional upon certification as a Helicopter Manager and ICT4 and completion of the documentation review and Demonstrated Competency under the evaluation of a Check Spotter.

Documentation Review

Review of Spotter Records: Yes No

1. Spotter Trainee Qualification Records complete _____ _____
2. Qualified as Helicopter Manager _____ _____
3. Qualified as a ICT4 _____ _____
4. Completion of four (4) operational rappels. _____ _____

Check spotter will utilize the following demonstrated competency check list for evaluating trainee spotters.
Demonstrated Competency

Rating Definitions and Requirements:

P=Pass
F=Fail

Spotter Trainee must achieve a Pass rating in all tasks to be eligible for approval to a Helicopter Rappel Spotter. A Fail rating for any task may end the evaluation at that point. Re-evaluation by a check spotter may occur at a later date once HERS (T) has received corrective training from a qualified rappel spotter.

Helicopter Mock-Ups

<table>
<thead>
<tr>
<th></th>
<th>Pass</th>
<th>Fail</th>
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<tbody>
<tr>
<td>1</td>
<td>Brief pilot and rappellers of helicopter mock-up operations.</td>
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<tr>
<td>2</td>
<td>Properly configure helicopter, per model specific requirements, with rappel and cargo equipment.</td>
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</tr>
<tr>
<td>3</td>
<td>Demonstrate proper spotting techniques and sequence including equipment checks, hand signals, verbage with pilot without procedural error. Communication with pilot must be clear, effective, and concise.</td>
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<tr>
<td>4</td>
<td>Exhibit comprehensive knowledge of possible emergency situations and demonstrate appropriate response and action.</td>
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<td>5</td>
<td>Exhibit proper cargo deployment techniques and proficiency from grounded helicopter using proper verbage with pilot.</td>
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<tr>
<td>6</td>
<td>Demonstrate command of all aspects of the rappel and cargo operation making prompt decisions and giving appropriate directions as needed.</td>
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<tr>
<td>7</td>
<td>Provide adequate and accurate feedback to rappellers and pilot post mock-up sequence.</td>
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</tr>
<tr>
<td></td>
<td>Description</td>
<td>Pass</td>
</tr>
<tr>
<td>---</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>1</td>
<td>Perform pre-flight risk assessment and mitigation to include manifests, load calculation, weather, fuel quantity, flight hazards, and communications.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Conduct comprehensive and appropriate pre-flight briefing with crew and pilot to review operations, risk management, and communications.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Properly configure helicopter, per model specific requirements, with rappel and cargo equipment.</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Demonstrate ability to operate radios and effectively communicate with dispatch or appropriate flight following authority and with ground and air resources (if present.)</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Perform proper high and low level reconnaissance of rappel area. Assure helicopter capabilities and limitations under given altitude, temperatures, weather conditions, and payload.</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Select primary and alternate rappel sites considering terrain, obstacles, winds, fire behavior and hazards.</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Demonstrate proper spotting techniques and sequence including equipment checks, hand signals, and berbage with pilot without procedural error. Communication with pilot must be clear, effective, and concise.</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Demonstrate proper cargo configuration and deployment procedures.</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>During rappel and cargo deployment, keep pilot/helicopter over rappel site with minimal movement.</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Deliver rappellers and cargo within plus or minus 10 feet from target, clear of trees and obstacles.</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Demonstrate command of all aspects of the rappel and cargo operation, making prompt decisions, and giving appropriate directions as needed.</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Conduct post rappel debriefing with crew and pilot emphasizing planned and actual events and what to reinforce or improve for next time.</td>
<td></td>
</tr>
</tbody>
</table>
HERS Trainee has met all requirements and performed all aspects of the evaluation to the satisfaction of the evaluating check spotter.

Yes___________________         No____________________

Authorization to Spot under Indirect Supervision

Date Certified as Helicopter Manager:______________________________________________
### Task 7

<table>
<thead>
<tr>
<th>Description</th>
<th>Evaluator /Date</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Live spotting of rappellers and cargo under indirect supervision by a Rappel Spotter. Code: P/W</td>
<td></td>
<td>Make sure to enter Spot-on Tracking Sheet</td>
</tr>
<tr>
<td>Proper configuration (model specific.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proper briefing crew/pilot</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proper equipment checks.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proper verbalization.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proper hand signals.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ensure OGE Power Check completed.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Select adequate rappel/cargo and alternative site.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maintain helicopter and rotor clearance throughout rappel/cargo sequence.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Maintain visual on ropes, rappellers, and cargo.

Re-configure helicopter in flight between deliveries of multiple sticks of rappellers (model specific)

Maintain focus and control of mission.

Complete a minimum of 10 live cycles without procedural error. Five (5) typical terrain, three (3) with cargo, one (1) emergency tie off.

Once the spotter trainee has completed all tasks associated with the Spotter Training Handbook and meets the additional requirements of a fully qualified helicopter rappel spotter, the trainee can be evaluated for full certification by a qualified check spotter.

## Qualification Record

<table>
<thead>
<tr>
<th>Following all procedures required in above tasks.</th>
<th>Evaluator</th>
<th>Date</th>
<th>Vegetation</th>
<th>Height</th>
<th>Make/Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cargo Rappellers</td>
<td>Timber</td>
<td>Brush</td>
<td>Open</td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
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<tr>
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<tr>
<td>19</td>
<td></td>
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</tr>
</tbody>
</table>
Check spotter will utilize the following demonstrated competency check list for evaluating trainee spotters.

The final evaluation will include a minimum of three (3) cycles with cargo at low, medium and high altitudes in typical terrain. Evaluation may occur in simulated or incident operations.
Demonstrated Competency

Rating Definitions and Requirements:

P=Pass

F=Fail

Spotter Trainee must achieve a **Pass** rating in all tasks to be eligible for approval to a Helicopter Rappel Spotter. A **Fail** rating for any task may end the evaluation at that point. Re-evaluation by a check spotter may occur at a later date once HERS (T) has received corrective training from a qualified rappel spotter.

**Helicopter Spotting**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Pass</th>
<th>Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Perform pre-flight risk assessment and mitigation to include manifests, load calculation, weather, fuel quantity, flight hazards, and communications.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Conduct comprehensive and appropriate pre-flight briefing with crew and pilot to review operations, risk management, and communications.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Properly configure helicopter, per model specific requirements, with rappel and cargo equipment.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Demonstrate ability to operate radios and effectively communicate with dispatch or appropriate flight following authority and with ground and air resources (if present.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Perform proper high and low level reconnaissance of rappel area. Assure helicopter capabilities and limitations under given altitude, temperatures, weather conditions,</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
and payload.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Select primary and alternate rappel sites considering terrain, obstacles, winds, fire behavior and hazards.</td>
</tr>
<tr>
<td>7</td>
<td>Demonstrate proper spotting techniques and sequence including equipment checks, hand signals, and verbage with pilot without procedural error. Communication with pilot must be clear, effective, and concise.</td>
</tr>
<tr>
<td>8</td>
<td>Demonstrate proper cargo configuration and deployment procedures.</td>
</tr>
<tr>
<td>9</td>
<td>During rappel and cargo deployment, keep pilot/helicopter over rappel site with minimal movement.</td>
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<tr>
<td>10</td>
<td>Deliver rappellers and cargo within plus or minus 10 feet from target, clear of trees and obstacles.</td>
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<td>11</td>
<td>Demonstrate command of all aspects of the rappel and cargo operation, making prompt decisions, and giving appropriate directions as needed.</td>
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<tr>
<td>12</td>
<td>Conduct post rappel debriefing with crew and pilot emphasizing planned and actual events and what to reinforce or improve for next time.</td>
</tr>
</tbody>
</table>

**Notes:**

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

HERS Trainee has met all requirements and performed all aspects of the evaluation to the satisfaction of the evaluating check spotter.

Yes___________________         No____________________
Example Tower inspection Forms

RAPPEL TOWER

ANNUAL PRE-USE CONDITION ASSESSMENT

CHECKLIST FORM

(To be completed by the Base Manager or Designee)

Tower Name

Date of Inspection

Inspected By
<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tower and Simulator - Overall Condition</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is the tower or simulator leaning or twisted?</td>
<td></td>
<td>If the tower or simulator is leaning or twisted, it should not be used and engineering should be contacted immediately.</td>
</tr>
<tr>
<td>Are there any broken or hanging members?</td>
<td></td>
<td>Any broken or hanging member will be required to be fixed before the tower can be used. Fixing major members may require a special inspection by the Regional Bridge Engineer or a qualified representative.</td>
</tr>
<tr>
<td>Are there any obvious missing parts?</td>
<td></td>
<td>Any missing parts will have to be replaced before the tower can be used.</td>
</tr>
<tr>
<td>Are all “X” bracing rods straight?</td>
<td></td>
<td>If any rod is bent or curved, this is an indication of a problem and the tower should not be used until the reason for the bent rod is found and corrected.</td>
</tr>
<tr>
<td>Is the lightning protection system intact and functional?</td>
<td></td>
<td>Lightning protection system must be functional before the tower can be used.</td>
</tr>
<tr>
<td>Is the aircraft warning light system working?</td>
<td></td>
<td>The warning light system must function at all times and the tower may be not used when they are not functional.</td>
</tr>
<tr>
<td><strong>Tower</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are all faying surfaces at all connections in firm contact?</td>
<td></td>
<td>If faying surfaces are not in firm contact, this may be an indication of movement of the tower or twisting or bending of a beam.</td>
</tr>
<tr>
<td>Are all grating properly installed with adequate attachment to supporting framework?</td>
<td></td>
<td>Any lose grating must be secured to the supporting framework before the tower can be used.</td>
</tr>
<tr>
<td>Are all anchor rods and bolts snug and tightened to 200 ft-lbs torque?</td>
<td></td>
<td>If any rod is bent or curved, this is an indication of a problem and the tower should</td>
</tr>
<tr>
<td>Question</td>
<td>Answer</td>
<td></td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Is at least one full thread for all bolts and anchor rods projected beyond the face of the nut?</td>
<td>If at least one full thread does not project beyond the face of the nut, this could be an indication of a problem and the tower should not be used until the reason is found and corrected.</td>
<td></td>
</tr>
<tr>
<td>Are “X” bracing rods installed under tension with no detectable sag?</td>
<td>If any rod is bent or curved, this is an indication of a problem and the tower should not be used until the reason for the bent rod is found and corrected.</td>
<td></td>
</tr>
<tr>
<td>Is the tower plumb and free from twisting or racking?</td>
<td>If the tower or simulator is leaning or twisted, it should not be used and engineering should be contacted immediately.</td>
<td></td>
</tr>
<tr>
<td>Are all members in good repair, checked for missing, cracked or broken parts?</td>
<td>Any broken or hanging member will be required to be fixed before the tower can be used. Fixing major members may require a special inspection by the Regional Bridge Engineer or a qualified representative.</td>
<td></td>
</tr>
<tr>
<td>Do all gates have properly working closing mechanisms and latches?</td>
<td>All gates must work and provide protect from entering areas where falling can occur before the tower can be used.</td>
<td></td>
</tr>
<tr>
<td>Are all handrails present to provide fall protection?</td>
<td>Any missing parts will have to be replaced before the tower can be used.</td>
<td></td>
</tr>
<tr>
<td>Have all the anchor points for rappellers and spotters been removed and NDT’d or replaced and been installed per manufacturer’s recommendations?</td>
<td>This can be done by tapping on the bolts with a carabineer and if they are loose, they will rattle or checked with a torque wrench.</td>
<td></td>
</tr>
<tr>
<td>Has all damaged paint been repaired?</td>
<td>Damaged paint should be repaired as soon as possible to help increase longevity of the tower.</td>
<td></td>
</tr>
<tr>
<td><strong>Simulator</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Are all faying surfaces at all connections in firm contact?</td>
<td>If faying surfaces are not in firm contact, this may be an indication of movement of the simulator or twisting or bending of a beam.</td>
<td></td>
</tr>
<tr>
<td>Are all grating properly fastened to supporting framework?</td>
<td>Any lose grating must be secured to the supporting framework before the tower can be used.</td>
<td></td>
</tr>
<tr>
<td>Are all members square, true and plum?</td>
<td>If members are not square and plum for the simulator, it should not be used and engineering should be contacted immediately.</td>
<td></td>
</tr>
<tr>
<td>Do all gates and doors work properly and have properly working closing mechanisms and latches?</td>
<td>The doors must slide easily, latch and provide safety when closed.</td>
<td></td>
</tr>
<tr>
<td>Have all weep holes been cleaned out?</td>
<td>Weep holes need to be open to allow any moisture that gets into the HSS to drip out.</td>
<td></td>
</tr>
<tr>
<td>Have all the anchor points for rappellers and spotters been removed and NDT’d or replaced and installed per manufacturer’s recommendations?</td>
<td>This can be done by tapping on the bolts with a carabineer and if they are loose, they will rattle or checked with a torque wrench.</td>
<td></td>
</tr>
<tr>
<td>Have all long and short plates, skid and J step been inspected? Include non-destructive testing method to identify cracks (minimum to be liquid dye penetration testing), check for bend, twist and racking.</td>
<td>All plates must be checked each year before the tower can be used.</td>
<td></td>
</tr>
<tr>
<td>Has all damaged paint been repaired?</td>
<td>Damaged paint should be repaired as soon as possible to help increase longevity of the simulator.</td>
<td></td>
</tr>
</tbody>
</table>

If any of the questions have been answered with a “No”, the problem **must be fixed** before any training is allowed on the tower.
RAPPEL TOWER
DAILY PRE-USE CONDITION ASSESSMENT
CHECKLIST FORM
(To be completed by Base Manager or Designee)

Tower Name

Date of Inspection

Inspected By

<table>
<thead>
<tr>
<th>Conditions</th>
<th>Yes</th>
<th>No</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is the tower or simulator leaning or twisted?</td>
<td></td>
<td></td>
<td>If the tower or simulator is leaning or twisted, it should not be used</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>and engineering should be contacted immediately.</td>
</tr>
<tr>
<td>Are there any broken or hanging members?</td>
<td></td>
<td></td>
<td>Any broken or hanging member will be required to be fixed</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>before the tower can be used. Fixing major members may</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>require a special inspection by the Regional Bridge Engineer or a</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>qualified representative.</td>
</tr>
<tr>
<td>Are there any obvious missing parts?</td>
<td></td>
<td></td>
<td>Any missing parts will have to be replaced before the tower can</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>be used.</td>
</tr>
<tr>
<td>Are all “X” bracing rods straight?</td>
<td></td>
<td></td>
<td>If any rod is bent or curved, this is an indication of a problem</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>and the tower should not be used until the reason for the bent rod is</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>found and corrected.</td>
</tr>
<tr>
<td>Have the tower and simulator been assessed for rough edges, burrs or other</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>aspects that may cause damage to ropes before use?</td>
<td></td>
<td></td>
<td>All rough edges, burrs or other aspects that may cause damage to ropes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>and equipment must be removed or mitigated before the tower can be used.</td>
</tr>
<tr>
<td>Is the landing area free of obstructions and hazards?</td>
<td></td>
<td></td>
<td>The landing area must be free of obstructions and hazards before the</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>tower can be used.</td>
</tr>
</tbody>
</table>
Has the landing area been loosened up prior to use? & No rappelling will be allowed if the rappel landing area is too hard and may cause knee and ankle injuries.  

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td><strong>Is lightning protection system intact and functional?</strong></td>
<td>Lightning protection system must be functional before the tower can be used. <strong>THE TOWER CANNOT BE USED DURING ANY KIND OF STORM.</strong></td>
</tr>
<tr>
<td><strong>Is the aircraft warning light system working?</strong></td>
<td>The warning light system must function at all times and the tower may be not used when they are not functional.</td>
</tr>
</tbody>
</table>

The **tower** will require a daily hands-on inspection by the Base Manager. At a minimum, it should consist of the following questions:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Are stairs, walkways and landings clear of snow, ice and debris and in good condition?</strong></td>
<td>All snow, ice and debris must be removed before any training is allowed on the tower.</td>
</tr>
<tr>
<td><strong>Are all landings and tower decks free of trip/slip hazards (e.g., water, protruding bolts)?</strong></td>
<td>All hazards will have to be removed or mitigated before the tower can be used.</td>
</tr>
<tr>
<td><strong>Is the railing system complete and in good condition?</strong></td>
<td>Any missing parts will have to be replaced before the tower can be used.</td>
</tr>
<tr>
<td><strong>Are toe boards installed in all areas where personnel could pass underneath?</strong></td>
<td>Any missing parts will have to be replaced before the tower can be used.</td>
</tr>
<tr>
<td><strong>Are all areas that pose a tripping or head hazard marked in yellow?</strong></td>
<td>All areas that pose a tripping or head hazard must be marked with yellow paint or tape before the tower can be used.</td>
</tr>
<tr>
<td><strong>Are the access control gates and latches present, functional and in good working condition?</strong></td>
<td>All gates must work and provide protect from entering areas where falling can occur before the tower can be used.</td>
</tr>
<tr>
<td><strong>Have the rope anchors been checked for distortion and tightness of bolts?</strong></td>
<td>This can be done by tapping on the bolts with a carabineer and if the bolts are loose, they will rattle or can be checked with a torque wrench.</td>
</tr>
<tr>
<td><strong>Have all required anchors for rappelers and spotters been installed?</strong></td>
<td>The lower platform should be setup before rappelers are allowed on the lower platform.</td>
</tr>
<tr>
<td>Is the tower plumb and free from twisting or racking?</td>
<td>If the tower is leaning or twisted, it should not be used and engineering should be contacted immediately.</td>
</tr>
<tr>
<td>-----------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Are all members in good repair - check for missing, cracked or broken parts?</td>
<td>Any broken or hanging member will be required to be fixed before the tower can be used. Fixing major members may require a special inspection by the Regional Bridge Engineer or a qualified representative.</td>
</tr>
<tr>
<td>Are all grating properly attached to supporting framework?</td>
<td>Any lose grating must be secured to the supporting framework before the tower can be used.</td>
</tr>
<tr>
<td>Have the past day’s use been reviewed and any high wind speeds, seismic events, falls during training and any other unusual events been noted?</td>
<td>The previous day’s paper work must be reviewed. Any problems from the day before must be fixed before the tower can be used.</td>
</tr>
</tbody>
</table>

The simulator will require a daily hands-on inspection by the Base Manager. At a minimum, it should consist of the following questions:

<table>
<thead>
<tr>
<th>Is the simulator clear of snow, ice and debris and in good condition?</th>
<th>All snow, ice and debris should be removed before any training is allowed on the tower.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is the railing system complete and in good condition?</td>
<td>Any missing parts will have to be replaced before the tower can be used.</td>
</tr>
<tr>
<td>Are all grating properly attached to supporting framework?</td>
<td>Any lose grating must be secured to the supporting framework before the tower can be used.</td>
</tr>
<tr>
<td>Are the access control gates and latches present, functional and in good working condition?</td>
<td>The gates must control access to the simulator; if they do function correctly the tower should not be used until fixed.</td>
</tr>
<tr>
<td>Have the rope anchors been checked for distortion and tightness of bolts?</td>
<td>This can be done by tapping on the bolts with a carabineer and if they are loose, they will rattle or checked with a torque wrench.</td>
</tr>
<tr>
<td>Have the simulator doors and latches been checked that they function correctly and are in good working condition?</td>
<td>The doors must slide easily, latch and provide safety when closed.</td>
</tr>
<tr>
<td>Question</td>
<td>Answer</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>Have all required anchors for rappelers and spotters been installed?</td>
<td>The simulator should be setup before rappelers are allowed in the simulator.</td>
</tr>
<tr>
<td>Have the long and short plates, skid and J-step inspected for signs of distortion?</td>
<td>The plates may not be used if they show signs of distress until they have been inspected by a qualified engineer.</td>
</tr>
</tbody>
</table>

**Other Items Noted:**


If any of the questions have been answered with a “No”, the problem **must be fixed** before any training is allowed on the tower.
Table of Contents
1 – Introduction / Program Overview .................................................................................................................. 3
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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.
Lesson | 1 - Introduction / Program Overview
--- | ---
**Objectives** | Obtain basic knowledge of Rappel Program Management
Introduce Rappeller candidates to performance based training.
**Time Frame** | 1 Hour
**Training Aids** | Interagency Helicopter Rappel Guides, Optional PowerPoint Presentation

### Lesson Outline

<table>
<thead>
<tr>
<th>Key Points</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <strong>Introduction</strong></td>
<td>Introduction powerpoint.</td>
</tr>
<tr>
<td>All available spotter, squadleaders, and specific rookie rappel group complete introductions, JHAs, safety message, general housekeeping rules, cover squads, and the week’s objectives.</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>2. <strong>History / Background</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>b. History</td>
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<table>
<thead>
<tr>
<th>3. <strong>Change Blindness</strong></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>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 introduce 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.</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>4. <strong>Performance Based Training:</strong></th>
<th></th>
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</thead>
<tbody>
<tr>
<td><strong>Initial Rappeller Training</strong></td>
<td></td>
</tr>
<tr>
<td>Rappeller 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.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Classroom Training (Equipment Orientation/Buddy Check)</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Ground Training</strong></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>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.</td>
<td></td>
</tr>
</tbody>
</table>
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
vii. **Inadequate rappel site situational awareness**  
   1. Rappelling past a problem (limb-over, missing the hole, etc.)  
   2. Slope and obstacle assessment

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:

   i. **Buddy Check**  
      1. PPE missing, in poor condition or incorrectly worn  
         (includes hair not tucked, nomex, harness poorly adjusted, leg strap buckled backwards)  
      2. BD Bag incorrectly worn (compression strap outside handle, clicklock ears not out, zipper not closed)

   ii. **Continual equipment inspection deficiencies**  
       1. Rappel rigging  
       2. Spotter Check

   iii. **Continual miss-rigging of rappel equipment**  
        1. Gunner strap  
        2. Seatbelt  
        3. Descent device

   iv. **Inappropriate or lack of response to spotters hand signal**

   v. **Continual exit problems (from exit seat to exit skid)**

   vi. **Locking-off problems**

   vii. **Continual landing problems (stutter stop, knee, step out)**

   viii. **Improper treatment of rappel equipment**  
        1. Dropping genie  
        2. Stepping on rope  
        3. Not properly stowing personal rappel equipment

   ix. **Procedures out of order**  
       1. Locking off prior to hooking up  
       2. Trying to move skid prior to releasing gunner strap
## Lesson 2 - Equipment Orientation, Issue, and Fit

### Objectives
1) Demonstrate proper use, care, of equipment
2) Development of equipment confidence.

### Time Frame
Performance Based

### Training Aids
Interagency Helicopter Rappel Guide available to students. All articles of rappel equipment. Optional PowerPoint Presentation.

### Lesson Outline

<table>
<thead>
<tr>
<th>Key Points</th>
</tr>
</thead>
</table>
| 1. Rappel Equipment Introduction  
   a. All equipment will be monitored, and life expectancy will be followed in order to maintain an adequate margin of safety.  
   b. Equipment approval process is identified in Chapter 3 of the IHRG  
   c. Any questions or concerns as to the condition or safety of equipment shall be directed to a Spotter. |
| Ref. Equipment powerpoint. |
| 2. Equipment Orientation  
   a. Helmet  
   b. Eye Protection  
   c. Fire Resistant Clothing  
   d. Agency Approved Boots  
   e. Rappel Gloves  
   f. BD Bag  
   g. Rappel and Spotter Harness  
   h. Knife  
   i. Descent Device  
   j. Rope  
   k. Carabiners  
   l. Snub Straps  
   m. Gunner Straps |
| See IHRG, Chapter 3.3.2 for particular details on rope care. |
| 3. Aircraft Equipment  
Note: Pilot may assist with this section.  
   a. Rappel Anchor – Helicopter Specific  
      i. Contractor – Built/Certified/Installed  
      ii. Inspected by the Agency  
   b. Spotter Attachment Point  
      i. Model Specific |
| Refer to San Dimas Equipment Development Center (SDEDC) Technical Bulletin on Ropes 5/25/90 and Aviation Technical Tip 06/92 |
## Lesson 3 – Buddy Checks

### Objectives
1) Demonstrate proper donning of Rappel Equipment
2) Demonstrate proper Buddy Check without error

### Time Frame
Performance Based

### Training Aids
Buddy Check PowerPoint, Personal Rappel Gear, Suitable Open Area

### Lesson Outline

1. **Set Up/Responsibilities**: Two veteran rappellers for demonstration purposes, one in flight suit, one in nomex clothing.

2. **Lead Instructor**: Walk through buddy check utilizing demo rappellers. Nomex must be clean and appropriate length, personal knives and sheaths are to be stowed inside of BD Bag. Let students know that everything is to be verbalized out loud. Use the buddy check guide below for instruction. Double tap of BD bag to turn rappeller around, shoulder tap rappeller to turn back exchange thumbs up.

3. **Check Spotter**: Determine when to introduce incorrect rigging of rappeller equipment: Demonstrate to individual squads as appropriate. Demonstration of incorrect rigging of rappeller equipment should include
   - Example - leg snap undone or drape outside of leg, knife stowed backwards
   - Examples of incorrect rigging of harness connecting hardware needs to be demonstrated at this time, including: only 1 soft loop captured, tri-link on backwards, and soft loop only captured by rubber gasket.

4. **Buddy Check Demonstration**
   NOTE: All steps of the Buddy Check are to be performed visually or visually and tactiley for thoroughness. Rappeller being checked will be attentive to each step of the Buddy Check process. If a discrepancy is found this check needs to be started over from the beginning.

   *Items below in bold must be checked both visually and tactiley.

   **A FLIGHT HELMET**
   1. Condition - (no cracks or damage)
   2. Eye protection –
      - **visor down & tight** or approved eye protection on with visor up & locked
   3. **Mic boom up and tight**
   4. Chin strap secured, adjusted to fit snuggly, with no loose ends.
   5. Avionics cord tucked into Nomex shirt or flight suit (As Appropriate)

   **B NOMEX**
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 HARNESS
1. Risers –
   - snugly fitted
   - webbing and visible stitching in good condition
   - no twists
   - buckles secured with no visual defects
2. Lat Straps -
   - snugly 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 indicate 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.
## Lesson 4 - Ground Training

### Objectives
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.

### Time Frame
Performance Based

### Training Aids
Training ropes attached to immovable object, suitable open area, personal rappel gear, descent control device.

<table>
<thead>
<tr>
<th>Lesson Outline</th>
<th>Key Points</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Set Up/Responsibilities:</strong></td>
<td></td>
</tr>
<tr>
<td>a. <strong>Equipment Division:</strong></td>
<td>Set up ropes, make sure 1 descent device exist per trainee,</td>
</tr>
<tr>
<td>b. <strong>Lead Instructor:</strong></td>
<td>Demonstrate how to rig the descent device, inspect, attach/detach and rappel following the curriculum below.</td>
</tr>
<tr>
<td></td>
<td>During your briefing cover verbalization, mechanics of braking, thumb position on rope, looking down the rope, don't step on rope.</td>
</tr>
<tr>
<td></td>
<td>As appropriate regaining of loss of rope control.</td>
</tr>
<tr>
<td></td>
<td><strong>Do not cover, knots or hand signals.</strong></td>
</tr>
<tr>
<td>c. <strong>Check Spotter:</strong></td>
<td>Overview 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.</td>
</tr>
</tbody>
</table>

| **Equipment Operations Demonstration** | |
| a. **Rigging the Descent Device** | |
| i. Descent Device in Left Hand | |
| ii. Orient the Descent Device | |
| iii. Thumbscrew on the right | |
| iv. Loosen thumbscrew, push detent pin in | |
| v. Remove cover, stow cover | |
| vi. Rope in the front, 2 ½ wraps to the right, out the back | |
| vii. Replace Cover | |
| viii. Detent pin out | |
| ix. Thumbscrew tight | |

b. **Inspection**

i. In the front, out the back, 2 in the window to the right

ii. Detent pin out, thumbscrew tight

iii. Display

c. **Attach/Detach**
### Field Practical

<table>
<thead>
<tr>
<th>Stage One</th>
<th>Stationary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start with multiple rappellers on each rope. Instruct rappellers how to properly rig rope to descent device and inspect rigged descent device. Spotter inspects each rigged descent device and returns to rappeller. Repeat process.</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Stage Two</th>
<th>Stationary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instruct rappellers to hook up to harness and lock off, Repeat Process. Spotters monitor ropes and rappellers.</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Prior to Stage Three, lead instructor will brief on the following.</th>
</tr>
</thead>
<tbody>
<tr>
<td>i. Everything is verbalized, out loud.</td>
</tr>
<tr>
<td>ii. Thumb position.</td>
</tr>
<tr>
<td>iii. Looking down the rope</td>
</tr>
<tr>
<td>iv. Mechanics of braking, to include different techniques, single and double hand. Left hand under for double braking not over. Stay there if double braking.</td>
</tr>
<tr>
<td>v. Slide your hand up to lock off</td>
</tr>
<tr>
<td>vi. Spotter’s don’t allow rappellers to step on rope</td>
</tr>
<tr>
<td>vii. Rope control</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stage Three</th>
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</thead>
<tbody>
<tr>
<td>One rappeller per rope, overseen by a spotter. Rappeller approaches rope on right side of body, rigs decent device, rappeller orients descent device, hooks up and locks off, display to spotter, spotter checks decent device. Instructs rappeller to unlock, rappel, brake, lock-off, repeat</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Check Spotter:</th>
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</thead>
<tbody>
<tr>
<td>Demonstrate to trainees ways a decent device can be rigged incorrectly.</td>
</tr>
</tbody>
</table>
## Lesson 5 - Suspension

### Objectives
1) To ensure correct harness fit  
2) Familiarize rappeller with equipment while weighted

### Time Frame
Performance Based

### Training Aids
Ropes attached to hanging device (pull up bars, lower tower), personal rappel gear, full PPE and BD Bag, descent control device.

<table>
<thead>
<tr>
<th>Lesson Outline</th>
<th>Key Points</th>
</tr>
</thead>
</table>

**Set Up/Responsibilities**: No hand signals, no spotter check required of the rappeller. Full PPE is required of trainees from this point on.

**Equipment Division**: Set up ropes, make sure 1 descent device exist per station. Have stools available for rappellers to step up on. One per station.

**Lead Instructor**: 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.

Do not cover: Hand signals, descending, landings or squatting to get off rope.

**Spotters**: Rig descent device, inspect device, no spotter check is required of the rappeller. Inform rappeller where and if adjustments are need to rappel harness

**Suspension Curriculum**
- **Rappellers perform buddy checks**
  - Spotter gives rigged descent device to rappeller
  - Rappeller steps up on platform.
  - Rappeller hooks up and locks off (verbalize)
  - Rappeller moves into hanging position-harness adjustment if necessary
  - When suspension is complete rappeller unlock descend as necessary unhook.
  - If adjustments are need have rappeller repeat suspension stage.
# Lesson

## 6 – Elevated Platform (Low Tower)

<table>
<thead>
<tr>
<th><strong>Objectives</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Recognize proper hand signals</td>
</tr>
<tr>
<td>2) Familiarize rappeller with fit and function of equipment</td>
</tr>
<tr>
<td>3) Recognize model specific rappel equipment.</td>
</tr>
<tr>
<td>4) Demonstrate hook-up and lock-off.</td>
</tr>
<tr>
<td>5) Demonstrate controlled descent.</td>
</tr>
<tr>
<td>6) Demonstrate proper braking techniques.</td>
</tr>
<tr>
<td>7) Demonstrate proper landing.</td>
</tr>
<tr>
<td>8) Demonstrate confidence and proficiency with equipment and procedures.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Time Frame</strong></th>
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</thead>
<tbody>
<tr>
<td>Performance Based</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Training Aids</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Training ropes, Low Tower Platform, Harnesses, two (2) instructors/spotters, JHA and Tower Safety Plan.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Lesson Outline</strong></th>
<th><strong>Key Points</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <strong>Training Aids</strong>: Training ropes, low tower platform, Full PPE and BD bag, JHA, gunner straps, objectives posted.</td>
<td></td>
</tr>
<tr>
<td>2. <strong>Set Up/Responsibilities</strong>: Two veteran rappellers for demonstration purposes. Spotter check can be performed by qualified spotter prior to rappeller going to low tower station.</td>
<td></td>
</tr>
<tr>
<td>3. <strong>Equipment Division</strong>: 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.</td>
<td></td>
</tr>
<tr>
<td>4. <strong>Lead Instructor</strong>: 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.</td>
<td></td>
</tr>
<tr>
<td>5. <strong>Check Spotter</strong>: 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.</td>
<td></td>
</tr>
<tr>
<td>6. <strong>Spotters</strong>: 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.</td>
<td></td>
</tr>
</tbody>
</table>

Suggested feeding the genie about 10 feet.
### Lower Tower Instructions-Briefed by Lead Instructor

#### Exit to Rappel ready
- 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.

#### Rappel
- Unlock begin rappel
- Descent control (braking, stopping)
- Looking down the rope
- Hand Placement
- Loss of rope control
- Double brake (demo rappeller)

#### Landings
- 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)

#### Low Tower Process
- Rappellers perform buddy checks (on the ground)
- Spotter rigs descent device, inspects rigging,
- Spotter completes check of rappeller (this may be completed by a qualified spotter prior to rappeller entering station)
- Rappeller hooks up gunner strap (type II platform). Snap on the right.
- Spotter hands descent device to rappeller
- 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)
- Spotter checks rigging and gives “Move to skids” signal (*remove gunner strap and move into pre-rappel position, suspended hanging, with no feet on the tower*).
- Rope on right side.
- Rappeller in ready position
- Spotter gives “Begin Descent” signal (downward sweep of hand)
- Rappeller unlocks, descends, brakes and lands (verbalize)
- Rappeller unhooks from descent device.
- Ground spotter removes descent device from rope.

---

**Platform spotter and ground safety spotter will be assigned for each rope in use.**

**Stress that at least one hand must be kept in a braking position while descending.**

**Emphasize looking down rope.**

**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.**

**Ensure all exits are tracked on Initial Rappeller Task Sheet.**
**Review of Double Braking/Loss of Rope Control (Lead Instructor)**

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.

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.

Break Low Tower operations for Knots overview.

**Introduction of Knots.**

**Lead Instructor:** 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.

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.

Same sequence as above, ground spotter ties knot in rope.

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).
Lesson 7 – Elevated Platform Emergency Procedures

**Objectives**
1) Identify and respond to Emergency Procedure hand signals from spotter.
2) Demonstrate rappeller emergency procedures without error.

**Time Frame**
Performance Based

**Training Aids**
Training ropes, personal rappel gear, and descent control device, pilot may be present.

<table>
<thead>
<tr>
<th>Lesson Outline</th>
<th>Key Points</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Equipment Division:</strong> Set up as many ETO stations as possible, make sure platforms exist for each station.</td>
<td>Remember risks exist and consequences are potentially <strong>FATAL</strong>! Everyone must understand this concept.</td>
</tr>
<tr>
<td><strong>Lead Instructor:</strong> 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.</td>
<td>Ref: IHRG Chapter 6.1 Rappeller procedures and signals.</td>
</tr>
<tr>
<td>• Routing of rope through harness</td>
<td>Re-iterate stopping well above the problem.</td>
</tr>
<tr>
<td>• Length of rope needed to complete ETO process</td>
<td>Ensure a proper length of looped tail is (6” – 12”) is left after half hitches are complete.</td>
</tr>
<tr>
<td>• Half hitches completed in clockwise direction, going behind the rope</td>
<td>It is recommended the first revolution be done near ground level to ensure proper instruction during the ETO sequence.</td>
</tr>
<tr>
<td>• Length of tail</td>
<td>Practice cutting unloaded retired ropes.</td>
</tr>
<tr>
<td>• Move rope to left side of body</td>
<td></td>
</tr>
<tr>
<td>• Remove knife, simulated cutting rope, stowing knife</td>
<td></td>
</tr>
<tr>
<td>• Rappeller gives “lift out” signal maintaining SA</td>
<td></td>
</tr>
<tr>
<td>• Rappeller gives “clear to fly away signal”, hands on genie.</td>
<td></td>
</tr>
<tr>
<td>• Once on the ground wait for slack then cut the rope above the half hitch.</td>
<td></td>
</tr>
<tr>
<td><strong>Check Spotter:</strong> 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</td>
<td></td>
</tr>
<tr>
<td><strong>Spotter:</strong> Rig descent device and check rigging, follow ETO process listed below.</td>
<td></td>
</tr>
<tr>
<td><strong>ETO Process</strong></td>
<td></td>
</tr>
<tr>
<td>1. Spotter rigs descent device on rope, and checks.</td>
<td></td>
</tr>
<tr>
<td>2. Spotter checks rappellers’ rigging</td>
<td></td>
</tr>
<tr>
<td>3. Rappeller step up onto platform</td>
<td></td>
</tr>
<tr>
<td>4. Spotter hands descent device to rappeller</td>
<td></td>
</tr>
<tr>
<td>5. Rappeller orients descent device, hooks up and locks off</td>
<td></td>
</tr>
<tr>
<td>6. Rappeller steps off the box.</td>
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</tr>
<tr>
<td>7. Spotter gives “Begin Descent” signal.</td>
<td></td>
</tr>
<tr>
<td>8. Rappeller unlocks, move to proper hand placement, locks off</td>
<td></td>
</tr>
<tr>
<td>9. Rappeller simulates knot, can’t untie knot goes to spread eagle.</td>
<td></td>
</tr>
<tr>
<td>10. Spotter gives ETO hand signal.</td>
<td></td>
</tr>
<tr>
<td><strong>Rappeller performs ETO, with simulated rope cut.</strong></td>
<td></td>
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</tbody>
</table>
Lesson 8 – Simulator (High Tower/Helicopter Simulator)

Objectives
1) Identify and demonstrate proper model specific seating configuration.
2) Demonstrate inspection of simulator rappel equipment (Model Specific)
3) Demonstrate spotter equipment check without error.
4) Identify and respond to spotter hand signals.
5) Demonstrate proficiency in exit from simulator.
6) Perform three minimum requirements for tower training listed below.

Time Frame
Performance Based

Training Aids
Training rope, high tower platform (minimum 20’) with simulator, fully equipped rappeller/trainees, two (2) instructors/spotters, and two (2) ground safety spotters, JHA and tower safety plan.

Lesson Outline

1. Minimum Requirements
   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.

2. Set Up/Responsibilities: Veteran rappellers for demonstration purposes. Lead spotter narrates high tower procedures while one spotter performs the procedures. Have group gather around high station demo.

3. Equipment Division: Setup high tower simulators with ropes, snub straps, carabiners, seatbelts, gunner straps, spotter tether attachments. Unlock simulator doors if applicable.

4. Lead Instructor: 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.

5. Check Spotter: 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.

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

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 spotter, spotter 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 but should be focused in the descent devices, snub straps, and carabineers.

- **For spotter safety no intentional miss-rigging of spotter equipment or attachment hardware will be used on the tower.**
- At the discretion of the check spotter, spotters will start to give incorrect hand signals

### High Tower Process

10. **Stage 1**
   a. Rappellers perform buddy check
   b. Spotter checks the rappellers outside the aircraft (thumbs up).
   c. 1st 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.
   d. Last rappeller loaded performs spotter check and gives thumbs up (Rappeller to verbalize what is being checked on spotter)
   e. Spotter checks rigging, knee taps inboard rappeller and gets thumbs up
   f. Spotter checks rappellers in simulator, gunner straps, and seatbelts.
   g. Spotter attaches spotter tether takes seat, connects seat belt.
   h. Spotter presents to Rappellers, exchange thumbs up
   i. Spotter removes and secures seat belt, and moves into position.
   j. Spotter opens doors and deploys ropes.
   k. First rappel is straight forward (spotter and squad leaders)
   l. Spotter gives rappellers remove seat belt signal (one rappeller at a time)
   m. Rappellers undo seat belts adjust and orient descent device, hook-up descent device, lock-off and presents.
   n. Spotters gives “move to skid” signal
   o. Rappellers undo gunner strap, move to skid and clear rope, check rigging interface.
   p. Spotter gives “begin descent” signal.
   q. Rappellers unlock, rappel, brake, and land.

Trainees suited in full rappel gear (Nomex, harness, BD, knife, helmet, gloves, and descent device.)

Instruct rappellers, if the rubber gasket breaks after the buddycheck, they may continue the process

**Note:** Emphasize rope bag control while in flight.

Emphasize to trainees to pull decent device tight when presenting to spotter.

Rappellers will need to ensure descent device does not crossload during this process.
11. **Stage 2**
   Brief new material continue high tower training as outlined above

   **Lead Instructor:** Introduce hand signals for stage two training.

   a. **Stop Hold Position:** Signal given by spotter to stop and hold rappeller in position prior to the “begin descent” signal:

   b. **Return to Seat:** Given by spotter to indicate rappellers should return to seat and buckle seat belt: May be a de-rig or rope cut scenario.

   c. **Bad Rope:** Given by rappeller to spotter to indicate there is something wrong with the rope and spotter should drop it.

   d. **Discontinue Rappel:** Given by rappeller to spotter to indicate bad rappel site, discontinue rappel.

12. **ETO’s:** Elaborate on ETO’s and time frames for working on problems.
    Repeat may not get signal to proceed with ETO after spread eagle.

    ➢ As trainees complete ETO training, have students cut a piece of rappel rope after completing ETO. This will be coordinated by Lead Trainer.

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.

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

Break and debrief “Are they ready for mock-ups?”

---

Note: Spotter will demonstrate de-rigging of equipment during mock ups.
# Lesson 8 – Helicopter Mock-UP

## Objectives
1. Identify model specific helicopter configuration.
2. Demonstrate model specific rappel procedures from helicopter on the ground without error or hesitation.

## Time Frame
Performance Based

## Training Aids
Rappel equipped helicopter, fully equipped spotter and rappellers/trainees.

### Lesson Outline

1. **Minimum Requirements.**
   
   Trainee will demonstrate a rappel sequence and emergency procedures until proficiency is demonstrated from all seating positions.

2. **Set Up/Responsibilities:** Prior to beginning mockups all rappellers need aircraft safety briefing. Full load of veteran rappellers for demonstration purposes.

3. **Equipment Division:** Rig aircraft with rappel equipment to include cargo.

4. **Lead Instructor:** 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.

5. **Check Spotter:** 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.

6. **Spotters:** 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.

7. **Additional Mock-up Items:**
   a. After a re-entry rappeller unlocks and unhooks from descent device, process ends there.
   b. During mockups’ perform de-rigging of descent device after re-entry and simulated rope cutting
   c. Full spotter PPE must be worn for at least 2 cycles per group.
   d. Trainers / spotters will not introduce or utilize rigging and or equipment errors on the last mock-up cycle.
   e. Pilots are required to participate in mock-up training prior to live rappels.

*Spotter that completes last mock-up cycle will spot first live rappel with trainees.*

### Key Points

- Pilot may be present in helicopter. This to acquaint the pilot with the rappel sequence and get the group working as a team.

- Trainees must be fully suited up and equipped during mock-up training.

- This is the real thing without being airborne.

- Remember that we will attain 100% proficiency before moving on to the next lesson.
### Lesson 9– Helicopter Rappels

#### Objectives
1. Demonstrate the ability to exit hovering helicopter safely and efficiently.
2. When exposed to different rappel problems or terrain, the trainee is able to complete rappel or corrective procedure without hesitation or error.

#### Time Frame
Performance Based

#### Training Aids
Rappel equipped helicopter, rappel qualified pilot, fully equipped spotter and ground spotters and rappellers/trainees.

### Lesson Outline

<table>
<thead>
<tr>
<th>Key Points</th>
<th>Note: Personnel may hold more than one (1) job; i.e., radio operator may be also be crash rescue personnel. Additional equipment may be needed to ensure a smooth transition between loads.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Requirements:</td>
<td></td>
</tr>
<tr>
<td>Rappellers shall complete a minimum of eight (8) live helicopter rappels without procedural error. The sequence and types of these rappels is described below.</td>
<td></td>
</tr>
</tbody>
</table>

2. **Set Up/Responsibilities:** Prior to helicopter rappels trainees must receive a briefing on emergency scenarios from pilot and spotter. Reference 6.2 Helicopter Emergencies. Ensure applicable personnel have been identified and are aware of assigned duties. Identify ground spotter, rappel sites, frequency utilization, and transportation. Load calculations completed. ABRO staffed, dispatch informed.

3. **Equipment Division:** Make sure manifests are complete and ropes are staged. Have rappel reports ready for documentation. Brief group on load assignments and equipment. Make sure rope turners are ready to go with equipment and inspection logs. Ensure veterans are available for gathering rappel equipment at each rappel site.

4. **Lead Instructor:** Brief group on live rappel operations and how they will be conducted. Let them know that no that there is no intentional miss-rigging of equipment. Ask if there are any questions, remind trainees to utilize their training and relax.

5. **Check Spotter:** Review performance based training. Penalties reset, only one major mistake will be allowed during the certifying rappels.

6. **Spotters:** Monitor trainees performance, correct deficiencies as needed.

7. **Ground Observer/Spotter**
   Assign a qualified spotter and one veteran rappeller to each rappel site. The spotter must critique each rappeller as soon as they get their rope and equipment gathered after each rappel. Each rappeller will be belayed on initial rappel and belaying will continue until trainee demonstrates controlled descent. Ground spotter may remove descent device from ropes between sticks.
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**
**Lesson**

### 10– Equipment Care and Inspection/Documentation

| Objectives | 1) Instruct students on how to properly inspect rappel equipment  
|            | 2) Introduce students to Chapter 3 of the IHRG on equipment inspection criteria.  
|            | 3) Inform students who is responsible for making repair or retiring rappel equipment.  
|            | 4) Introduce students to equipment and inspections logs. |

| Time Frame | Performance Based |

| Training Aids | 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 |

| Lesson Outline | Key Points |

**Equipment Division:** Test audio and visual equipment. Have powerpoint presentation ready to go. Have equipment and inspection logs available. Gather demo equipment.

**Lead Instructor:** Present power point, provide examples as appropriate, answer question. Show student how to fill out equipment and inspection logs.

**Check Spotter:** Monitor the group for questions
Appendix E. Spotter Training
## INTERAGENCY HELICOPTER RAPPEL SPOTTER TRAINING

<table>
<thead>
<tr>
<th>Lesson</th>
<th>1 - Introduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objectives</td>
<td>Recognize a standard format for cargo letdown/rappel spotter training.</td>
</tr>
<tr>
<td>Training Aids</td>
<td>Interagency Helicopter Rappel Guides, Optional PowerPoint Presentation.</td>
</tr>
</tbody>
</table>

### Lesson Outline

<table>
<thead>
<tr>
<th>Key Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructors should utilize personal experience as training aids.</td>
</tr>
</tbody>
</table>

### 1. Introduction

The spotter is the key position in ensuring the safe deployment of rappellers. Decisions made by spotters can determine the success or failure of the mission. It is therefore essential that a spotter is well trained, proficient and competent in their role.

### 2. Lesson Agenda

- Lesson 1 Policy and Procedures
- Lesson 2 Documentation and Administration
- Lesson 3 Hazards, Limitations
- Lesson 4 Communications
- Lesson 5 Equipment
- Lesson 6 Cargo Letdown
- Lesson 7 Rappel Spotter
- Lesson 8 Simulated Mission

### Note:
The Spotter Training Record book will be used in conjunction with this training.
### INTERAGENCY HELICOPTER RAPPEL SPOTTER TRAINING

**Lesson:** 2 – Policy and Procedures

**Objectives:** Discuss how to maintain compliance with all applicable agency and/or interagency policies and procedures.

**Training Aids:** IHRG, applicable Agency Manuals/Handbooks, Unit Fire Management Plan, Unit Aviation Plan, Base Operations Plan, Rappel Operations Plan, Agency Aviation Accident Prevention Plan, National and GACC MOB Guides, Job Hazard Analysis Spotter Training Record.

<table>
<thead>
<tr>
<th>Lesson Outline</th>
<th>Key Points</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Policy</strong></td>
<td><strong>IHRG Chapter 2.3.2</strong></td>
</tr>
<tr>
<td>a. Interagency Helicopter-Rappel Guide contains requirements for:</td>
<td><strong>Spotter Training Record book</strong></td>
</tr>
<tr>
<td>i. Spotter prerequisites</td>
<td></td>
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<tr>
<td>ii. Spotter training requirements</td>
<td></td>
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<tr>
<td>iii. Fitness standards and requirements</td>
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<tr>
<td>iv. Proficiency requirements</td>
<td></td>
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<tr>
<td>b. Agency specific regulations and policy</td>
<td></td>
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<tr>
<td><strong>2. Procedure</strong></td>
<td></td>
</tr>
<tr>
<td>a. Applicable portions of Unit Fire Management Plans.</td>
<td></td>
</tr>
<tr>
<td>c. Initial attack dispatch procedures.</td>
<td></td>
</tr>
<tr>
<td>d. Off forest rappel procedures.</td>
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<tr>
<td>e. Large incident operations</td>
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<tr>
<td>f. Standard initial attack loads (numbers and equipment)</td>
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<tr>
<td>g. Training and proficiency schedule.</td>
<td></td>
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<tr>
<td>h. Booster rappellers plan (if applicable.)</td>
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</tbody>
</table>
## INTERAGENCY HELICOPTER RAPPEL SPOTTER TRAINING

<table>
<thead>
<tr>
<th>Lesson:</th>
<th>3 – Documentation/Administration</th>
</tr>
</thead>
</table>
| Objectives: | 1) Identify proper rappel logbook and documentation forms.  
2) Discuss the importance of timely and accurate rappel documentation as outlines in IHRG Chapter 4 |
| Training Aids: | IHRG Chapter 4, Appendix C |

<table>
<thead>
<tr>
<th>Lesson Outline</th>
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</tr>
</thead>
<tbody>
<tr>
<td>1. Refer to Chapter 4 of the IHRG</td>
<td>IHRG Appendix C</td>
</tr>
<tr>
<td>2. Logs and Record Keeping</td>
<td>Applicable records and logs.</td>
</tr>
<tr>
<td>3. Ensure appropriate equipment and rappel logs are current and maintained. Reference Chapter 4 of the IHRG.</td>
<td>Instructor should stress the importance of keeping thorough and up to date equipment, training and operations logs.</td>
</tr>
</tbody>
</table>
INTERAGENCY HELICOPTER RAPPEL SPOTTER TRAINING

Lesson: 4 – Hazards, Limitations

Objectives:
1) Discuss and interpret potential hazards encountered during rappel operations.
2) Demonstrate risk management evaluation skills.

Training Aids: SAFECOM’s, I Hog, Flight Manual, IRPG, IHRG

Lesson Outline

<table>
<thead>
<tr>
<th>Key Points</th>
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</thead>
<tbody>
<tr>
<td>1. Hazards</td>
</tr>
<tr>
<td>a. Discuss hazards that could have an impact on rappel operations. These include but are not limited to:</td>
</tr>
<tr>
<td>i. Weather conditions</td>
</tr>
<tr>
<td>1. Pilot and spotter should look for weather and wind signs that could indicate turbulence or downward movement of air at destination.</td>
</tr>
<tr>
<td>a. A good indicator on fires is the smoke column; is it shifting direction, laying horizontal or blowing downhill? Is it plume dominated?</td>
</tr>
<tr>
<td>b. Are there thunderstorms in the area?</td>
</tr>
<tr>
<td>c. Is there increased turbulence when flying on the lee side of ridges or geographical prominences?</td>
</tr>
<tr>
<td>Any of the above conditions may be an indicator of hazardous landing, rappelling, or firefighting conditions.</td>
</tr>
<tr>
<td>ii. Visibility</td>
</tr>
<tr>
<td>iii. Terrain</td>
</tr>
<tr>
<td>iv. Shadows</td>
</tr>
<tr>
<td>v. Equipment Malfunctions (rappeller/spotter)</td>
</tr>
<tr>
<td>vi. Equipment Malfunctions (helicopter)</td>
</tr>
<tr>
<td>vii. Fire behavior</td>
</tr>
<tr>
<td>viii. Review SAFECOM’s</td>
</tr>
<tr>
<td>b. Stress to trainee that even though the pilot has the ultimate responsibility for mission safety, the spotter must use sound judgment and abort the mission if conditions exist that he/she deems unacceptable or unsafe.</td>
</tr>
</tbody>
</table>

2. Mission Limitations |
| a. Discuss the effects the following can have on mission success: |
| i. Altitude |
| ii. Temperature |
| iii. Payload |
| iv. CG |
| v. Fuel Load |
| vi. Pilot limitations (fatigue, etc.) |

 b. Crew limitations (fatigue, “Can Do” attitude, etc.)

Emergency Challenge and Response/Risk Management.

Model specific limitations.

Discuss mission options.

Off loading of some personnel and/or cargo.

Choose an off-site landing and have personnel hike to the incident.

Move site selection to achieve better helicopter performance.

Refuse assignment, suggest other options.

Utilize PC project/large monitor to present pictures/video of past rappel fires.

Have trainees study pictures and/or video to simulate: Size-up to dispatch.

Proper site selection with pilot and rappellers. Address risk and hazards that may be present to the helicopter and rappellers.

IHOG Chapter 6-1

Weight and Balance Calculations
Lesson 4 – Hazards, Limitations – (Continued)

3. Risk Management
   a. Review the rappel risk management for fire missions.
   b. Stress the importance of following a procedure for sound risk management in all aspects of a mission.
   c. Perform pre-flight risk assessment and mitigation to include manifests, load calculation, weather, fuel quantity, flight hazards, and communications.
   d. The GAR Risk Assessment model may be used as a deliberate risk assessment tool for mission planning purposes.
   e. After Action Reviews (AAR)-Stress the value of utilizing AAR as part of good risk management.

IHOG Chapter 3-1
Spotter Risk Management Training Program Emergency challenge and Response/Risk Management
Appendix M GAR Risk Assessment Model.
## INTERAGENCY HELICOPTER RAPPEL SPOTTER TRAINING

**Lesson:** 5 – Communications

### Objectives:
1. Demonstrate proper hand signals for communications with rappeller without error.
2. Discuss guidelines for proper communications with area dispatch.
3. Demonstrate ability to effectively communicate verbally between pilot/spotter and non-verbally between rappeller/spotter.

### Training Aids:
IHRG Chapter 5, simulation cards, etc.

### Lesson Outline

<table>
<thead>
<tr>
<th>Key Points</th>
<th>Model specific procedures.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IHRG Chapter 5.7 Hand signals.</td>
</tr>
<tr>
<td></td>
<td>Simulated dispatch and simulated rappel.</td>
</tr>
<tr>
<td></td>
<td>Emergency and standard challenge and response/risk management.</td>
</tr>
<tr>
<td></td>
<td>Trainer will use current challenge and response document as a training aid to ensure spotter will use standard communications.</td>
</tr>
</tbody>
</table>

### 1. Pre and Post Mission Briefings

Pre and post mission briefings between the pilot, rappellers and spotter are essential. Items to be identified in the briefing include:

- What is the mission?
- Where is the mission?
- Potential hazards
- Pre-flight and in-flight checks.
- Trigger points for aborting the mission
- Emergency procedures

### 2. Pilot/Spotter Communications

Challenge and Response is a required communication procedure between the spotter and rappeller. Throughout the rappel process “go” or “no go” decisions must be relayed before proceeding to the next step. Generally C/R is a simple response needed from the pilot before the spotter can complete a step in the rappel sequence i.e., spotter states “main and tail are clear, move right 30 feet.” During the rappel sequence there are critical times when the spotter needs specific information from the pilot.

An example of this is prior to sending rappellers the spotter and pilot must communicate power settings are within limits.

It is essential that the spotting and pilots use standard communications for rappel operations. All communications must be clear, concise and understood. Some terminology (i.e., “opening doors”) can be dependent on the make and model of helicopter. However, the following standardized terminology is to be used during normal rappel operations.

- Directional movement
  - “Left”
  - “Right”
  - “Forward”
  - “Back”
v. “Up”
vi. “Down”

**Directional:** Stating a directional distance will assist the pilot while over the rappel spot, i.e. Spotter may state “we are drifting, hold, main/tail are clear, move right 50 feet.”

**Lesson 5 – Communications – (Continued)**

b. Procedural
   i. “How’s the power?”
   ii. “Dropping rope bags”
   iii. “Rope bags on the ground”
   iv. “Rappeller(s) to the skids”
   v. “How’s the power?”
   vi. “Sending rappeller(s)”
   vii. Rappellers position(s) in relationship to the descent, i.e., “Halfway down.”
   viii. “Rappeller(s) on the ground.”
   ix. “Rappeller(s) off the rope.”
   x. “De-rigging (left/right) side.”
   xi. “Dropping rope (left/right) side.”
   xii. “Clear to depart.”

3. **Spotter/Rappeller**

   Communications between the spotter and rappeller are non-verbal. Hand signals are used in place of words. Therefore, the first step in establishing spotter/rappeller communications is to ensure the rappellers attention stays focused on the spotter. (Instructor demonstrates standard hand signals.)

4. **Flight Following Communications**

   Review standard flight following procedures.

5. **Operational Communications**

   Instruct trainee in pre/post rappel communications with dispatch, Helibase, etc.

   a. Size up
   b. Landing to configure (lat/long)
   c. Over rappel site; Adjust radios to reduce external distraction
   d. Rappel complete, establish communication with inserted rappellers, and ensure they have positive communications with dispatch, helibase, etc.
# INTERAGENCY HELICOPTER RAPPEL SPOTTER TRAINING

## Lesson: **6 – Equipment**

### Objectives:
1. Identify rappeller/spotter equipment and demonstrate inspection and care of that equipment.
2. Recognize proper utilization and care of rappel equipment, including PPE.

### Training Aids:
IHRG Chapter 3, MTDC web site: [www.fs.fed.us/t-d/rappel/index.htm](http://www.fs.fed.us/t-d/rappel/index.htm)

<table>
<thead>
<tr>
<th>Lesson Outline</th>
<th>Key Points</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Inspection</strong></td>
<td></td>
</tr>
<tr>
<td>a. Review equipment requirements and standards in IHRG</td>
<td>Spotter harness with tether.</td>
</tr>
<tr>
<td>b. Instruct trainee in the proper methods of equipment inspection.</td>
<td>Rappel and letdown equipment</td>
</tr>
<tr>
<td>i. If the helicopter is available instruct trainee in the proper methods of anchor and attachment point inspection. (If the helicopter is not available at this portion of the training, this must be covered prior to mock-ups.)</td>
<td>Model specific equipment</td>
</tr>
<tr>
<td>ii. Stress to the trainee that even through the rappeller is responsible for inspection and maintenance of their equipment, that the spotter is ultimately responsible for monitoring the use and care of all rappeller/spotter equipment. All equipment requirements and standards can be found in the IHRG.</td>
<td>Review anchor inspection requirements.</td>
</tr>
</tbody>
</table>
# Lesson: 7 – Cargo Letdown

This lesson can be taught as a standalone or be combined with Lesson 8 when the individual is being trained for both cargo letdown and Rappel Spotter concurrently.

## Objectives:
1. Describe the function of all cargo letdown equipment
2. Demonstrate proper model specific cargo letdown configuration.
3. Demonstrate proper cargo letdown procedures without error.
4. Demonstrate effective communications with pilot.

## Training Aids:
IHRG, Model specific rappel procedures associated with cargo equipment.

## Lesson Outline

<table>
<thead>
<tr>
<th>Key Points</th>
<th>Gather cargo letdown equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground Training</td>
<td>IHRG model specific procedures, Appendix B</td>
</tr>
<tr>
<td>a. Review model specific procedures. Familiarize trainee with equipment. Review applicable portions of IHRG.</td>
<td></td>
</tr>
<tr>
<td>b. Familiarize trainee with spotter equipment checks and spotter “buddy check.” Stress that the spotter is responsible to ensure all equipment is in good condition and properly fitted.</td>
<td>IHRG Chapter 5.3</td>
</tr>
<tr>
<td>c. Cargo letdown training should be accomplished utilizing a rappel tower in addition to helicopter mock-ups, but utilizing helicopter mock-ups as the sole means of ground training is acceptable.</td>
<td>The pilot(s) must be present during this phase of the training.</td>
</tr>
<tr>
<td>e. Demonstrate placement and securing of cargo.</td>
<td>IHRG Appendix E</td>
</tr>
<tr>
<td>f. Demonstrate pre-flight checks i.e., spotter equipment check, hook checks, etc.</td>
<td>Rappel Spotter Training Record.</td>
</tr>
<tr>
<td>g. Demonstrate cargo configuration procedures.</td>
<td></td>
</tr>
<tr>
<td>h. Demonstrate cargo letdown procedures, including spotter/pilot communications, and emergency procedures.</td>
<td></td>
</tr>
<tr>
<td>i. Trainee will perform anchor inspection, securing of cargo, cargo letdown procedures, spotter/pilot communications, including emergency procedures until instructor deems the competency level is accomplished. (Minimum of three (3) complete cycles without procedural error.)</td>
<td></td>
</tr>
</tbody>
</table>

## Helicopter Deployment

a. Under the supervision of a Cargo/Rappel Spotter, trainee will inspect equipment, prepare cargo load, configure the helicopter and deploy a minimum of ten cargo letdown cycles, without procedural error, at low, medium, and high heights. Five (5) of these deployments will be in typical terrain. Final evaluation will be completed by a Check Spotter.

b. Should at any point during live cargo deployment the trainee makes repetitive procedural errors, the instructor will return the trainee to ground training for additional training.
Lesson: **8 – Rappel Spotter**

If cargo letdown and rappel spotter are being taught concurrently, integrate Lesson 7-Cargo Letdown, with this portion of the training.

**Objectives:**
1) Demonstrate proficiency (without procedural error) to successfully spot rappels from an elevated platform during training.
2) Spot 20 complete rappel cycles from the platform level. Five (5) consecutive loads shall be accomplished without procedural error and shall include cargo letdown. If a simulator accommodates two (2) rappellers, then that would count as one cycle.
3) Demonstrate ability to effectively communicate both verbally and non-verbally.
4) Spot a minimum of eight (8) mock-up cycles without procedural error.
5) Under supervision of qualified spotter, shall spot a minimum of 10 live cycles without procedural error at low, medium, and high (Appendix I) height. Five of these must be in typical terrain, and three (3) shall include cargo.

**Training Aids:** IHRG Chapter 2, 5, 6, Appendix B

**Lesson Outline**

<table>
<thead>
<tr>
<th>1. <strong>Ground Training</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Reference Appendix B model specific procedures.</td>
<td><strong>Key Points</strong></td>
</tr>
<tr>
<td>b. Familiarize trainee with spotter equipment checks and spotter “buddy check.” Stress that the spotter is responsible to ensure all equipment is in good condition and properly fitted.</td>
<td>Review IHRG Appendix D</td>
</tr>
<tr>
<td>c. Review applicable portions of IHRG for hand signals and emergency procedures</td>
<td>Emergency Procedures IHRG Chapter 6</td>
</tr>
<tr>
<td>d. Trainee must participate with the training of new rappellers.</td>
<td>Recognize procedural errors and demonstrate effective communication with trainee rappellers to include constructive feedback.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. <strong>Low Tower</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Instructor will demonstrate rappel spotter procedures for low tower.</td>
<td></td>
</tr>
<tr>
<td>i. Tether attached.</td>
<td></td>
</tr>
<tr>
<td>ii. Rappeller buddy check completed.</td>
<td></td>
</tr>
<tr>
<td>iii. Rappeller equipment check.</td>
<td></td>
</tr>
<tr>
<td>iv. Use appropriate hand signals to move rappeller(s) into position.</td>
<td></td>
</tr>
<tr>
<td>v. Final equipment check.</td>
<td></td>
</tr>
<tr>
<td>vi. Hand signal to send rappeller(s).</td>
<td></td>
</tr>
<tr>
<td>vii. Emergency signals.</td>
<td></td>
</tr>
<tr>
<td>b. Trainee will demonstrate the above until instructor deems the competency level needed to move to the high tower is accomplished. It is important that the trainee verbalize all actions including spotter/pilot communications.</td>
<td>Review Emergency Challenge and</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. <strong>Low Tower</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Instructor will demonstrate rappel spotter procedures for low tower.</td>
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<tr>
<td>i. Tether attached.</td>
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<td></td>
</tr>
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<td></td>
</tr>
<tr>
<td>v. Final equipment check.</td>
<td></td>
</tr>
<tr>
<td>vi. Hand signal to send rappeller(s).</td>
<td></td>
</tr>
<tr>
<td>vii. Emergency signals.</td>
<td></td>
</tr>
<tr>
<td>b. Trainee will demonstrate the above until instructor deems the competency level needed to move to the high tower is accomplished. It is important that the trainee verbalize all actions including spotter/pilot communications.</td>
<td>Review Emergency Challenge and</td>
</tr>
</tbody>
</table>
3. **High Tower with Simulator**
   a. Instructor will demonstrate:
      i. Anchor inspection.
      ii. Proper configuration of cargo for deployment (as appropriate by specific simulator)
      iii. Proper attachment of carabiners, ropes and snub strap to anchor points.

   **Lesson 8 – Rappel Spotter— (Continued)**

   iv. Proper sequence for loading rappellers including:
       1. Attaching equipment
       2. Completed buddy checks
       3. Spotter check
       4. Final checks prior to launch
   v. In flight procedures
   vi. Fire/rappel spot size up and evaluation
   vii. Selection of secondary site.
   viii. Contact with dispatch
   ix. Proper sequences for deploying cargo with rappellers.
       1. Off site power check.
       2. Setting up over rappel site.
       3. Confirming mission is a go.
       4. Use of hand signals to remove seat belts.
       5. Use of hand signals to drop rope bags.*
       6. Use of knot in rope signal and acknowledgement (if applicable)
       7. Use of hand signals to send rappellers to skids.
       8. Final checks
       9. Use of hand signals to send rappellers.
       10. Disconnecting and dropping ropes.
       11. Cargo deployment
       12. Departing rappel site and reestablishing communications.

   b. Trainee will demonstrate the above until instructor deems the competency level needed to move to emergency procedures is accomplished. It is important that the trainee verbalize all actions including spotter/pilot communications.

4. **Emergency Procedures**
   a. A spotter must be thoroughly familiar with and able to accomplish emergency procedures. The instructor will demonstrate using equipped rappellers, all established emergency procedures. Instructor will stress the importance of dialog between the pilot and spotter during emergency situations. It is imperative that the spotter retain control and composure during an emergency.
   b. The trainee will demonstrate using equipped rappellers all established emergency procedures. At a minimum, the IHRG requirements pertaining to this portion of
the training shall be accomplished. It is important that the trainee verbalize all actions including spotter/pilot communications during this phase of training.

5. **Mock-Ups**  
   a. Instructor will demonstrate anchor inspection, proper configuration of cargo and rappel equipment, loading of rappellers, cargo and rappeller deployment, including spotter/pilot communications and emergency procedures.
   b. Trainee will simulate deploying cargo and rappellers during mock-ups until the required minimum (eight (8) mock-up cycles without procedural error) has been accomplished.
   c. Highly recommended that scenarios are incorporated to enhance spotter training.

**Lesson 8 – Rappel Spotter– (Continued)**

6. **Helicopter Deployment**  
   a. Under the direct supervision of a rappel spotter, trainee will inspect equipment, prepare cargo load, configure the helicopter and deploy a minimum of ten rappel cycles, without procedural error, at low, medium and high heights. Five (5) of these deployments will be in typical terrain, three (3) shall include cargo and one (1) ETO. Final evaluation will be completed by a rappel checks spotter.
   b. Should at any point during live helicopter deployment the trainee makes repetitive procedural errors, the instructor will return the trainee to the appropriate level of training for review (ground, tower, mock-ups.)

---

<table>
<thead>
<tr>
<th>procedure post emergency.</th>
</tr>
</thead>
<tbody>
<tr>
<td>For quick helicopter egress, remember you and your rappellers are still tethered to the helicopter.</td>
</tr>
<tr>
<td>The pilot(s) must be present during this phase of the training.</td>
</tr>
</tbody>
</table>

**Note:** Whenever helicopter is in flight and doors are open or off, spotter or designated rappeller(s) are responsible for maintain hold on rope bag(s) until rope(s) are deployed from the helicopter.

IHRG Appendix D  
Spotters Training Record.
# INTERAGENCY HELICOPTER RAPPEL SPOTTER TRAINING

**Lesson:** 9 – Simulated Mission

**Objectives:**
1) Successful demonstration of spotter competency and knowledge.

**Training Aids:**
SAFECOM’s, Base operating plan, base rappel plan, pictures of past fires and fuel type and sand table.

<table>
<thead>
<tr>
<th>Lesson Outline</th>
<th>Key Points</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Simulation Logistics</strong></td>
<td>Utilize PC projector/large monitor to present pictures/video of past rappel fires.</td>
</tr>
<tr>
<td>a. Instructor will pre-select a location for a simulated fire.</td>
<td>This section may utilize Task 7 of the Spotter Training Record.</td>
</tr>
<tr>
<td>b. Instructor will coordinated with local dispatch center, FMO and other necessary personnel to facilitate a live training scenario.</td>
<td>Have trainees study pictures and/or video to simulate Size-up to dispatch.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>2. Tasks to be Completed</strong></th>
<th>Proper site selection with pilot and rappellers.</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Trainee will ensure that the helicopter and Initial Attack (IA) personnel are prepared for an IA mission</td>
<td></td>
</tr>
<tr>
<td>b. Trainee will demonstrate the correct operational procedures to respond to an IA dispatch call.</td>
<td></td>
</tr>
<tr>
<td>c. Trainee will assist pilot with navigation and communications while en route to simulated fire.</td>
<td></td>
</tr>
<tr>
<td>d. Trainee will provide a fire size up and other applicable information to dispatch.</td>
<td></td>
</tr>
<tr>
<td>e. Trainee will demonstrate the appropriate procedure to prepare for a rappel i.e., landing to configure, prepare cargo, etc.</td>
<td></td>
</tr>
<tr>
<td>f. Trainee will successfully deploy a minimum of one stick of rappellers performing all operational procedures.</td>
<td></td>
</tr>
<tr>
<td>g. Trainee will ensure deployed rappellers have established communications, re-configure helicopter and return to base.</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>3. Post Mission</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Trainee will complete mission documentation forms and conduct AAR.</td>
<td></td>
</tr>
<tr>
<td>b. Successful completion of the scenario does not replace a final evaluation by a check spotter.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Address risk and hazards that may be present to the helicopter and rappellers.</td>
</tr>
</tbody>
</table>
Rappel Pilot Certification

1. Interagency Helicopter Rappel Guide Pilot Requirements
   a. Meets the appropriate requirements of the contracting document
   b. Qualified and approved by agency inspector pilot for long-ling.
   c. Qualified spotter will brief, demonstrate, train, and familiarize the pilot on rappel operations and equipment.
   d. Pilot will attend mock-up training, (Ground simulation of rappel operations utilizing helicopter.)
   e. Final approval for rappel operations will be based upon:
      i. Completion of spotter provided briefing and training.
      ii. Demonstrated ability to pilot the helicopter during a series of simulated rappels and cargo letdown operations.
      iii. Demonstrated ability to coordinate with rappel spotter.
      iv. Demonstrated knowledge of rappel emergency procedures during emergency procedures simulation and helicopter emergency procedures effect on rappel operations.

2. Pilot Rappel Training Syllabus
   a. Briefing and familiarization on rappel anchor and hard point for specific model including inspection procedures.
   b. Briefing and demonstration of rappel equipment use and inspection to include harness, descent device, rope, accessories, and PPE.
   c. Seating arrangement for rappellers and spotters.
   d. Cargo placement, loading, securing, rigging, inspection, and letdown procedures.
   e. Exit procedures, sequences and emergency procedures (Review rappel guide.)
   f. Model specific procedures (Review rappel guide.)
   g. Helicopter mock-up training to include cargo letdown, rappel sequence, rappel emergency procedures simulation and helicopter emergency procedures.
   h. Expectations for pre-rappel mission briefing.
   i. Risk Management procedures and analysis process.
   j. Review rappel site selection criteria including:
      i. Personnel
      ii. Safety zones
      iii. Fire behavior
      iv. Analysis, emergency fly away site, Helicopter clearance, Ability to land rather than rappel.
   k. Pilot and spotter authority and responsibility to cancel any mission deemed unsafe or too high risk.
Interagency Helicopter Operations Steering Committee
Interagency Helicopter Rappel Subcommittee
Charter

1. Background

The National Wildfire Coordinating Group (NWCG) was formed in January 1974, to expand operational cooperation and coordination between various public agencies having jurisdictional responsibility for wildland fire management.

In 2007, NWCG was re-chartered, expanding its responsibility and adding new partners. The committee chartered herein is one of a number of support groups established by the NWCG to provide stewardship for specific business segment areas in fire management.

This group is a subcommittee to the Interagency Helicopter Operations Steering Committee

Historically, most of the functional business areas to be addressed by this subcommittee were the responsibility of the former Interagency Helicopter Rappel Working Group (IHRWG).

2. Name

The name of this subcommittee, hereinafter referred to as the Subcommittee, is the Interagency Helicopter Rappel Subcommittee (IHRSC) of the Interagency Helicopter Operations Steering Committee (IHOps).

3. Authority


The deliberations of this Committee are exempt from the Federal Advisory Committee Act under section 204 of the Unfunded Mandates Reform Act of 1995.

The Subcommittee Chair is authorized to convene meetings and schedule agenda items. The Chair is also authorized to make contacts, negotiate work assignments, and make commitments on behalf of the Subcommittee.
4. Purpose

The Interagency Helicopter Rappel Subcommittee (SC) has been established under the IHOps as an interagency group providing oversight to interagency helicopter rappel operations. The mission of this Subcommittee is to ensure safe, effective and efficient helicopter rappel operations.

5. Membership

Subcommittee membership will reflect a mix of people who are knowledgeable in the subject area of the Subcommittee and who are from NWCG member agencies and organizations, including representation from DOI Aviation Management Directorate (AMD).

The Subcommittee will include one Forest Service Washington Office representative, one Forest Service Regional Helicopter Operations Specialist and one representative from each of the following agencies with rappel or cargo letdown programs: Aviation Management Directorate, Department of Interior Bureaus and cooperating State Agencies. Members will be assigned by the respective IHOps Steering Committee member. A liaison will be assigned to the Subcommittee from the IHOps Steering Committee.

The Subcommittee Chair and Co-Chair will be assigned from the group members and rotate after a term of two (2) years. The rotation will be as follows AMD, BLM, FS, NPS and WO FS. Any new agencies will be added to the rotation in alphabetical order. At the end of the two (2) years term the Co-Chair will become the Chair and a new Co-Chair will be assigned.

Technical Advisors may include representatives from the Forest Service Technology and Development Program, a Helicopter Inspector Pilot, and an Aviation Maintenance Inspector. Technical Advisors serve as non-voting participants of the Subcommittee. Technical Advisors will be assigned by the IHOps Committee when requested by the Subcommittee. Additional technical advisors may be added as associate members with Subcommittee approval.

6. Organization

The Subcommittee is under the direction of the IHOps.

The Subcommittee may charge members or technical advisors with tasks, or create working groups and task teams.

The Subcommittee will work through the respective IHOps liaison to ensure appropriate coordination, collaboration, and information sharing with other groups and organizations for the subject matter and specific tasks of the Subcommittee.
7. **Responsibility**

The Subcommittee is primarily responsible to:
- Review and evaluate interagency helicopter rappel operations and issues.
- Solicit and address concerns with operations, personnel qualifications, safety, training, equipment and procedures.
- Maintain, update and distribute the Interagency Helicopter Rappel Guide.

8. **Charter Amendments**

Changes to, or revocation of, this charter must follow the process outlined in the *NWCG Operating Principles and Guidelines*.

9. **Charter Approval**

This charter is effective as of the date of approval by the Chair of the IHOps and shall remain in effect until revised or revoked.

*Approved:*

[Signature]
Chair, Interagency Helicopter Operations Steering Committee (IHOps)

[Signature]
Date
Appendix H – Interagency Helicopter Rappel Equipment and Procedures Committee Charter

Mission Statement

The Interagency Helicopter Rappel Equipment and Procedures Committee (REPC) is a sub-committee of the Interagency Helicopter Rappel Working Group (RWG). The primary mission for the REPC is to establish a formal process for review and evaluation of current and proposed helicopter rappel equipment and rappel procedures. Based on those evaluations, the REPC will submit recommendations to the Rappel Working Group.

Objectives

The REPC will solicit, review, and evaluate inputs from the field on rappel equipment and procedures from all Forest Service regions and other Agencies involved in the helicopter rappel program. The REPC will respond to issues and concerns regarding currently approved rappel equipment and procedures.

The REPC will prepare and submit proposals and recommendations to the Rappel Working Group.

Group Composition

The REPC shall consist of members selected on the basis of interest, expertise, and willingness to serve. The membership shall include one operational rappel spotter from Department of Interior Bureaus, Forest Service Regions, and cooperating State agencies. The Rappel Equipment and Procedures Project Leader from MTDC will serve as a non-voting member to provide technical information and support to the group.

The Chair of the Rappel Working Group or designee will serve as contact for the REPC and may attend meetings when necessary. Specialists and ad hoc participants may be utilized for limited term assignments as needed.

Replacement of Members

Replacement of members will be solicited from respective Rappel Working Group member.

Selection of the Chairpersons

The committee will elect a Chair and Co-Chair from group members for a term of two (2) years. At the end of the two (2) year term the Co-Chair will become the Chair and a new Co-Chair will be elected.
Meeting Frequency and Decision Making

Meetings will be held at the Chairperson’s request to provide timely input to the Rappel Working Group. The committee will meet at least once annually. Attendance shall be limited to Equipment Committee representatives or approved designees and participating guests. A quorum will consist of 70% of voting Equipment Committee members. Any designee representing an Equipment Committee member will have voting privileges. Consensus and voting decisions will be documented and maintained.

Chair Responsibilities

Establish the time and place for all group meetings and conference calls.

Request the attendance of guest participants. Coordinate guest participation and attendance timeframes.

Ensure Equipment Committee tasks are completed.

Monitor progress of task groups and ensure assignments are completed.

Represent the Equipment Committee at Working Group meetings.

Assure meeting notes, decisions and information are disseminated to the Equipment Committee, Working Group Chair and other individuals as applicable, (e.g. Interagency rappel community).

Co-Chair Responsibilities

Assume duties of the Chair in their absence.

Assure notes, decisions and voting results are recorded for all meetings and conference calls.

Assemble, correlate, and prepare all material to be acted upon by the Equipment Committee.

Coordinate with the Chair for delegation of work assignments.

Will assume Chair position after two (2) years

Approved:

Thomas R. York

Chair, Interagency Helicopter Rappel Working Group
## Acronyms and Definitions

### Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGL</td>
<td>Above Ground Level</td>
</tr>
<tr>
<td>AMD</td>
<td>Aviation Management Directorate</td>
</tr>
<tr>
<td>BLM</td>
<td>Bureau of Land Management</td>
</tr>
<tr>
<td>DOI</td>
<td>Department of Interior</td>
</tr>
<tr>
<td>FSH</td>
<td>Forest Service Hand Book</td>
</tr>
<tr>
<td>FSM</td>
<td>Forest Service Manual</td>
</tr>
<tr>
<td>IA</td>
<td>Initial Attack</td>
</tr>
<tr>
<td>IHOG</td>
<td>Interagency Helicopter Operations Guide</td>
</tr>
<tr>
<td>IHOPS</td>
<td>Interagency Helicopter Operations Steering Committee</td>
</tr>
<tr>
<td>IHRG</td>
<td>Interagency Helicopter Rappel Guide</td>
</tr>
<tr>
<td>HERS</td>
<td>Helicopter Rappel Spotter</td>
</tr>
<tr>
<td>JHA</td>
<td>Job Hazard Analysis</td>
</tr>
<tr>
<td>Mic</td>
<td>Microphone</td>
</tr>
<tr>
<td>MTDC</td>
<td>Missoula Technology and Development Center</td>
</tr>
<tr>
<td>NFPA</td>
<td>National Fire Protection Association</td>
</tr>
<tr>
<td>NPS</td>
<td>National Park Service</td>
</tr>
<tr>
<td>OSHA</td>
<td>Occupational Safety and Health Administration</td>
</tr>
<tr>
<td>PPE</td>
<td>Personal Protective Equipment</td>
</tr>
<tr>
<td>IHREPC</td>
<td>Interagency Helicopter Rappel Equipment and Procedures Committee</td>
</tr>
</tbody>
</table>
Definitions

**Anchor:** Means of attaching the rope to an object. For helicopter rappelling, the anchor is an approved “fail-safe” attachment point for the rappel ropes, tethers, or other devices to the helicopter.

**Bight:** A V-shaped bend in a rope that comes back on itself, but does not cross.

**Booster Rappeller:** A qualified rappeller from another exclusive-use rappel base. Booster rappellers are used to augment the rappel crew capability at the host base when there is demonstrated need, or anticipated need.

**Challenge & Response:** One party presents a question (challenge) and another party must provide a valid answer (response) to validate the action.

**Descent Device or Descender:** A metal device through which the rope passes; designed to create friction, as needed, during a rappel. Tension from the brake hand provides the device with friction to control the rate of descent or stop.

**Direct Supervision:** Direct supervision is defined as qualified spotter presence on board the helicopter during the rappel operation. The spotter may be a rappeller if the trainee has shown competency as a spotter trainee.

**Feed or Feeding:** The act of pushing or sliding a rope through a decent device.

**Figure 8 Cargo Delivery Device:** A device for inducing friction to a rope or letdown line. The shape of the device resembles the numeral “eight”. It is available with or without ears. Another name includes Rescue 8.

**Fire Season:** A season is continuous employment in a primary wildland fire position for a period of 90 days or more.
**Glaze or Glazing:** Heat generated during rapid rappels can overheat an area on a rope or webbing to the point of momentarily melting the nylon sheath fibers, which cool into a hard crystalline coating. When glazing occurs, it should be considered for rope or webbing retirement.

**Gunner Strap:** A restraint that keeps the rappeller tethered to the helicopter (typically Type II helicopters) during the period between removing their seat belt and hooking up to the Sky Genie. (Must conform to MTDC Drawing 984)

**Lock-Off:** A technique intended to temporarily attain a stationary position on the rope.

**Non-Operational Rappel:** Any rappel performed in a controlled environment where the purpose of the rappel is training or proficiency, and not operational in nature.

**Indirect Supervision:** Indirect supervision is defined as a qualified HERS at the base of operation for the departure and return of the helicopter and not on board the helicopter.

**Internal Abrasion:** Damage caused by internal friction from dirt and grit particles trapped between fibers inside a rope. Use of a rope filled with these particles can severely damage the rope from the inside out.

**Operational Rappel:** Any rappel performed for the purpose of accomplishing a task once the rappeller is on the ground. This may include rappelling fire fighters, search and rescue, or law enforcement personnel to perform a specific task.

**Rappeller:** A person trained and certified to rappel from a helicopter in accordance with agency specific policy and direction contained in the IHRG.

**Rappel Check Spotter:** A qualified rappel spotter that has at least three (3) seasons experience as a qualified rappel spotter and has been approved by an agency specific Helicopter Operations Specialist to provide oversight in the rappel program and evaluate spotter candidates.

**Rappel Configured:** Spotter and rappeller(s) have donned rappel and spotter gear. All personnel have performed necessary equipment and procedure checks and are in approved seating positions. Helicopter is configured with ropes and rigged descent devices. Cargo is packaged and secured with adequate letdown gear on board and in position for cargo deployment. Bucket, longline, remote hook, and additional fire fighting tools may or may not be on board, as environmental conditions, mission requirements, and helicopter performance dictate.

**Rappel Equipped:** Spotter and rappellers on board with all necessary equipment for initial attack and rappel operations. Essential cargo (bucket, longline, remote hook, additional fire fighting tools) will be on board as mission planning dictates.

**Rappel Height(s):** Rappels are generally categorized into three heights as follows:

- **Low** = below 75 feet AGL
- **Medium** = 75 to 150 feet AGL
- **High** = above 150 feet AGL
**Rappel Spotter:** A person trained and certified, in accordance with agency specific policy and direction contained in the IHRG. They are responsible for directing and managing rappel operations, providing instruction for initial rappeller candidates, spotter trainees, certifying rappellers and ensuring compliance with the IHRG.

**Rookie Rappeller:** A qualified first year rappeller having less than one season of rappel experience on an exclusive use helicopter rappel crew.

**Twisty Rope:** A rope that twists into loops or “pig tails” below the Genie to the extent that it impedes a rappeller’s descent in a rappel, or interferes with their ability to unhook from the Sky Genie when a rappel is completed.

**Veteran Rappeller:** A qualified rappeller having one or more seasons of rappel experience on an exclusive use helicopter rappel crew.

**Rappel Stick:** Two rappellers deployed simultaneously from a helicopter.

**Trainee:** A designation attached to any position that denotes a person who successfully meets the training requirements, but has not been certified to perform operational missions in that capacity without direct supervision of a qualified rappel spotter.
Equipment and Procedure Development Process

1. **Objectives**
   a. Increase the quality and efficiency of rappel equipment development work and reduce development costs.
   b. Properly balance input and participation in the equipment development process by rappel bases, Technology and Development (T & D) Centers and State, Regional, and Washington Office Management.
   c. Identify priorities for T & D Centers’ development work by systematically identifying priority rappel problems that can be solved by equipment development.
   d. Clearly identify procedures and items of rappel equipment for standardization to facilitate interregional exchange of rappellers, increase safety, and maximize efficiency.
   e. Clearly identify operational procedures and technical requirements for each item of equipment in advance of development work.

2. **Tech Services**
   Tech services is a generic T & D term used to describe inquiries into technical matters that occasionally arise, such as investigating manufacturing flaws or equipment failures. A small amount of money is budgeted each year in anticipation that unforeseen events will occasionally surface that need immediate and expert attention. The primary distinction between regularly funded projects and tech service issues is that tech service issues generally:

   1. Need a quick answer or resolution
   2. Are not funded through the normal Fire and Aviation Management Steering Committee process.
   3. Do not generally require large amounts of work/money to resolve.

   If upon investigation a tech service issue turns out to be more complex or costly than originally anticipated, it may be assigned to a project and funded through the Fire and Aviation Management Steering Committee or other avenues.

3. **Approved Process**
   Outlined below is the formal process for obtaining the necessary approval and technical support for helicopter rappellers to propose new or improved equipment and/or procedures.
a. When a field user perceives a need for a new or improved piece of equipment or procedure, documentation of that need must be submitted to the Rappel Equipment and Procedures Committee (REPC) through the regional/area REPC representative using the Rappel Equipment/Procedures form, (Forms are available on the Helicopter Rappel Website listed at the beginning of Chapter 3, or through your Regional REPC Representative) where it will be evaluated based on the above objectives and the following criteria:
   i. Critical Safety
   ii. Interagency Standardization
   iii. Priority
   iv. Probability of success

b. Using the above criteria, the IHREPC will evaluate the proposal and send a recommendation with reasons for supporting or rejecting the proposal to the Interagency Rappel Working Group. The Chair of the IHREPC will notify the submitter of the disposition.

c. After evaluating the proposal, if the RWG concurs that the proposal has potential merit, the proposal is approved and if necessary forwarded to IHOPS.

Note: Prior to any field evaluation, written approval must be obtained by the RWG from the appropriate agency official (example: USFS National Aviation Officer).

d. If a proposal is accepted, it will follow one of the paths outlined below:
   i. If the proposal is a change in procedure or an “off-the-shelf” piece of equipment that does not require extensive testing and development, it will receive the appropriate engineering test and/or review in coordination with appropriate agency equipment specialist.
   ii. If the proposal requires a major equipment development effort (i.e., engineering design, drawings, testing, etc.) the IHRWG will forward the proposal to IHOP’s. IHOP’s will evaluate the proposal based on the above mentioned criteria and if approved, take the necessary steps to secure funding for the project. Once funding is assigned, the design, engineering and development work is performed under the direction of the appropriate agency equipment specialist.

e. Upon a successful evaluation the equipment will be formally approved.
Rappel Equipment Irregularity Reporting Protocols

1. If a piece of equipment used in rappel or cargo letdown operations is suspected or proven to have contributed to a rappel related accident or incident with potential, the equipment shall be immediately sequestered and removed from service. The process for sequestering equipment and notifying agency specialists of such incidents shall follow any agency requirements.

2. The Interagency Helicopter Rappel Subcommittee is responsible for notifying all agency rappel users of known or suspected problems involving rappel or cargo letdown equipment.

3. The responsible regional HOS shall also notify their Regional Aviation Safety Manager. For DOI rappel operations; the responsible RAM/SAM shall also notify their national Aviation Safety Manager.

4. Individual members of IHRSC are responsible for disseminating information on corrective actions or policy changes to their respective constituents.
Appendix L – GAR Rappel Risk Assessment

The GAR model allows for time critical risk assessment and generates communication concerning the mission risks. This communication then helps identify the risk and leads to the appropriate mitigation. The GAR model can be applied in a variety of situations. It can be used to help identify programmatic risk and is efficient enough to be utilized as a pre-mission risk assessment tool. The GAR model is not intended to replace pre-mission planning, briefings and debriefings, or post action follow-up, but to provide an efficient risk management tool for dynamic environments.

Making risk decisions at the appropriate level establishes clear accountability. Those accountable for the success or failure of a mission must be included in the risk decision process. The higher the risk the more mitigation may be necessary. If significant difference in the same rating categories are identified all team members will re-evaluate the mission and address any mitigation prior to continuing with the mission.

It provides a more general analysis of the operational system and provides a qualitative rating scale for each of the categories that correspond to the identified areas of risk. It is important to remember that risk management is a process that continues throughout the mission and each assessment model allows management to set the acceptable risk standards as they apply to each mission.

The GAR model should be applied to helicopter rappel missions as appropriate. All helicopter program managers shall receive training on the GAR model and its use. Helicopter program managers shall be responsible for implementing the GAR model with all members of the team at their base.

Additional information on risk management can be found in Chapter 3 and Appendix M of the Interagency Helicopter Operations Guide.

A GAR Risk Assessment, which creates a GO/NO-GO decision tool, will be conducted individually by each member of the Team prior to initial dispatch on the Operational/Mission Risk Assessment Worksheet. Individual scores will be compiled on the Spotters/Manager Assessment Worksheet and reviewed and discussed by all members of the Team. Mitigation if any will be discussed and documented on the Worksheet. The assessment may be completed at the beginning of an operational period, but must be reviewed and updated if the team or mission changes or other mission-specific information becomes available. The Team is made up of the Pilot, Spotter/Helicopter Manager, and First IC/Lead Crew. While assigned to a Large Incident the Helibase Manager or Equivalent will be considered an essential team member.

Operations that have a total post mitigation score in the amber range can be conducted with pilot and Spotter/Manager concurrence. Rappel operations with a post mitigation score in the red must have the highest level of supervision assigned approval.
Completed GAR’s will be kept on file at the host base location either electronically or hard copy for the operational season.

Compute the total level of risk for each hazard identified below. Assign a risk score of zero (0) (No Risk) through ten (10) (maximum Risk) for each element. This is your personal estimate of risk. Add the individual risk scores to come up with a Total Risk Score.

**Supervision**
Supervisory Control considers how qualified the supervisor is and whether effective supervision is taking place. Even if a person is qualified to perform a task, supervision acts as a control to minimize risk. The higher the risk, the more the supervisor needs to be focused on observing and checking. A supervisor who is actively involved in a task is easily distracted and should not be considered an effective safety observer in moderate to high-risk conditions.

**Planning**
Planning and preparation should consider how much information you and other resources that you may be interacting with have; how accurate it is, and the amount of time available to plan for and evaluate the existing and emerging conditions.

**Contingency Resources**
If the plan experiences failure what contingency is in place? Backup resources that can assist if needed. Contingency resource planning accomplished with cooperators. Evaluate shared communications plan and frequencies. Has alternate plan to rappel been evaluated?

**Communication**
Evaluate how well involved personnel are briefed and communicating (CRM). An evaluation of the communication systems that are available should include; the technical capability, infrastructure, operational reliability, and organizational communication culture.

**Team Selection**
The selection of individual resources should evaluate the character and competence of the individuals to be used. On occasion individuals may have to be replaced during the operation, which will require an assessment of any new team members and how they will be able to interact with those already engaged.

**Team Fitness**
Team fitness should consider the physical and mental state of the crew to include the rappellers, spotter, pilot, and helicopter. The amount and quality of duty/rest a team member has had as well as an evaluation of all internal and external stress are important factors to consider.

**Environment**
Consider factors affecting the performance of personnel, equipment, and the organization, including; time of day, wind and other weather conditions, topography, temperature and altitude. Evaluate specific factors such as narrow canyons, forest canopy, and site selection. However, they should be eyed with caution as the operational environment is very dynamic.

**Incident Complexity**
Evaluate the experience level of the team. Generally, the longer one is exposed to a hazard, the greater are the risks. The situation includes considering how long the environmental conditions will remain stable and the complexity of the work.

<table>
<thead>
<tr>
<th>Supervision</th>
<th>&lt;1 2 3 4 5 6 7 8 9 10&lt;</th>
<th>Planning</th>
<th>&lt;1 2 3 4 5 6 7 8 9 10&lt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supervisor has perfect knowledge about the mission, personnel, capabilities and limitations, and is able to apply the appropriate control to minimize risk</td>
<td>4 5 6 7 8 9</td>
<td>There is a well designed plan that is reviewed and revised as needed to meet the demands for safety and efficiency and to account for adaption. Time is well managed</td>
<td>4 5 6 7 8 9</td>
</tr>
<tr>
<td>Supervisor has little knowledge about the mission, personnel, capabilities and limitations, and lacks skill, knowledge or ability to apply the appropriate control to minimize risk.</td>
<td>1</td>
<td>There is no plan or the plan doesn’t address many current adaptations made in response of demands for efficiency. Time constraints have a strong effect on ability to plan.</td>
<td>1</td>
</tr>
<tr>
<td>Contingency Resources</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reliable alternative equipment and personnel are available, easily accessed and informed about the mission requirements</td>
<td>4 5 6 7 8 9</td>
<td>The outcome depends on the equipment and personnel assigned completing the mission perfectly. Failure is not an option.</td>
<td>4 5 6 7 8 9</td>
</tr>
<tr>
<td>Communication</td>
<td>&lt;1 2 3 4 5 6 7 8 9 10&lt;</td>
<td></td>
<td>&lt;1 2 3 4 5 6 7 8 9 10&lt;</td>
</tr>
<tr>
<td>Interpersonal communications are clear and there is a high level of trust in the organization. Adequate personnel and technology are available to relay information accurately to those who make the decisions</td>
<td>4 5 6 7 8 9</td>
<td>There is low trust in the organization or the personnel/communication equipment is unreliable based on the expected needs for the mission</td>
<td>4 5 6 7 8 9</td>
</tr>
<tr>
<td>Team Selection</td>
<td>&lt;1 2 3 4 5 6 7 8 9 10&lt;</td>
<td></td>
<td>&lt;1 2 3 4 5 6 7 8 9 10&lt;</td>
</tr>
<tr>
<td>Multiple personnel with skill, knowledge and ability are available to fulfill the requirements of the mission. Selection and preparation are done well in advance so there is plenty of time for personnel to get personal and job related demands addressed.</td>
<td>4 5 6 7 8 9</td>
<td>Only one person is available and the success of the mission depends on that person juggling many responsibilities to squeeze this mission into the work schedule. Additional time will be donated to keep up with the workload.</td>
<td>4 5 6 7 8 9</td>
</tr>
<tr>
<td>Team Fitness</td>
<td>4 5 6 7 8 9</td>
<td></td>
<td>4 5 6 7 8 9</td>
</tr>
<tr>
<td>Personnel are trained, proficient, healthy, and rested prior to starting the mission. Personal issues are addressed and little external stress is being exerted.</td>
<td>4 5 6 7 8 9</td>
<td>Personnel lack one or more critical component in their training. These persons have been squeezing in many additional duties as assigned distracting them from their proficiency or personal life.</td>
<td>4 5 6 7 8 9</td>
</tr>
<tr>
<td>Environment</td>
<td>&lt;1 2 3 4 5 6 7 8 9 10&lt;</td>
<td></td>
<td>&lt;1 2 3 4 5 6 7 8 9 10&lt;</td>
</tr>
<tr>
<td>Weather and visibility are conducive to the best possible chance for success in the mission. Operational tempo is appropriate for the mission.</td>
<td>4 5 6 7 8 9</td>
<td>Winds are unpredictable, temperature is extreme, low ceilings and visibilities, precipitation, sun angle creates strong shadows, etc. Mission tempo is too low or high.</td>
<td>4 5 6 7 8 9</td>
</tr>
<tr>
<td>Mission Complexity</td>
<td>&lt;1 2 3 4 5 6 7 8 9 10&lt;</td>
<td></td>
<td>&lt;1 2 3 4 5 6 7 8 9 10&lt;</td>
</tr>
<tr>
<td>A single agency is involved with personnel from the same unit who regularly work together. Mission is straight forward and covered by standard operating procedures.</td>
<td>4 5 6 7 8 9</td>
<td>Multiple agencies are involved in a mission that defies definition or has ever been attempted. Personnel are new to each other and come from different cultures. Many leaders are emerging and working toward different objectives.</td>
<td>4 5 6 7 8 9</td>
</tr>
</tbody>
</table>

- The ability to assign numerical values or "color codes" to hazards is not the most important part of risk assessment.

- Team discussion is critical to understanding the risks and how they will be managed
### Operational/Mission Risk Assessment Worksheet

<table>
<thead>
<tr>
<th>Date</th>
<th>Mission</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
</tr>
</tbody>
</table>

Risk rated 1-10 for each category. (Mitigations should be considered for any category rated higher than 5)

**Overall Mission Risk**

<table>
<thead>
<tr>
<th>Supervision</th>
<th>Presence, accessibility and effectiveness of leadership for all teams and personnel. Clear chain of command.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planning</td>
<td>Current SOP/Operational Guidelines, team trained in accordance with same. Adequate mission planning time. Required equipment, training is provided. Briefs/debriefs planned, team input solicited.</td>
</tr>
<tr>
<td>Contingency Resources</td>
<td>MOU’s in place with participating cooperators. Planning accomplished with cooperators. Shared communications plan and frequencies.</td>
</tr>
<tr>
<td>Communications</td>
<td>Infrastructure: Radio communications possible throughout area of operations (presence of portable repeaters.) Communications plan established and rehearsed.</td>
</tr>
<tr>
<td>Team Selection</td>
<td>Level of individual training and experience. Cohesiveness and atmosphere that values input/self critique.</td>
</tr>
<tr>
<td>Team Fitness</td>
<td>Level of overall physical fitness of team. Level of crew members’ rest/fatigue and overall morale. Team members with major life distractions.</td>
</tr>
<tr>
<td>Environment</td>
<td>Extreme temperatures, elevation, difficulty of terrain (aspect, foliage, slope, etc..) long approach, remoteness.</td>
</tr>
<tr>
<td>Incident Complexity</td>
<td>Severity and probability of mishap. Potential for incident that would tax the current staffing levels.</td>
</tr>
</tbody>
</table>

**Post Mitigation**

<table>
<thead>
<tr>
<th>Pilot</th>
<th>Spotter/Manager</th>
<th>IC/Lead Crew</th>
<th>Helibase Manager*</th>
<th>Post Mitigation Score</th>
</tr>
</thead>
</table>

**Totals**

<table>
<thead>
<tr>
<th>Green</th>
<th>Amber</th>
<th>Red</th>
</tr>
</thead>
<tbody>
<tr>
<td>Score: 0-35</td>
<td>Score: 36-80</td>
<td>Score: 61-80</td>
</tr>
<tr>
<td>Low Risk Proceed with Mission</td>
<td>Moderate Risk Proceed with Caution</td>
<td>High Risk Implement Measures Prior to Proceeding</td>
</tr>
</tbody>
</table>
Mitigations:

_____________________________________________________________________________________
_____________________________________________________________________________________
_____________________________________________________________________________________
_____________________________________________________________________________________
_____________________________________________________________________________________
_____________________________________________________________________________________
_____________________________________________________________________________________
RAPPEL RISK MANAGEMENT FOR FIRE MISSIONS

The use of this appendix is not mandatory. It is intended to be used as a supplement to other risk management training tools.

Section 1: Preflight, in flight, arrival, and size-up

A Preflight

1. Pre-flight helicopter checks completed by pilot.

2. Load calculation for destination elevation and temperature completed by pilot and reviewed by spotter.

3. Flight hazard map checked by pilot for aerial hazards on flight route and at destination.

4. Weather forecast and fire indices reviewed by pilot, spotter, and rappellers.
   a. Thunderstorms and strong winds such as those associated with a cold front can create hazardous conditions for landing/rappelling and increase fire behavior.
   b. Winds blowing perpendicular to ridges or across geographical prominences can increase lee-side turbulence and should dictate extra caution in landing/rappel site selection.

5. Spotter and rappellers should review pocket card for representative fuel type and conditions.
   a. High or extreme fire behavior indices should indicate extra caution in landing/rappel site selection.

6. Decision Point 1: Before departure the spotter must consider the environmental and operational factors and local unit recommendations that influence departing the base of operations configured or equipped.

7. Cargo secured and checked by spotter.
   a. Ropes and Sky Genies rigged and checked by spotter. (If not rappel ready, instead check to insure that rappel gear is on board helicopter and secured)
   b. Rappeller checks completed by spotter. (If not rappel ready, skip this step)

B En route to destination:

1. Establish & maintain positive flight following.

2. Pilot, spotter and rappellers practice in-flight CRM.
3. Any observed aircraft or potential problems should immediately be communicated to the pilot by intercom.

4. Ensure maximum crew participation in searching for and calling out any aerial hazard.

5. Pilot and spotter should look for weather and wind signs that could indicate turbulence or downward movement of air at destination.
   a. A good indicator on fires is the smoke column; is it shifting direction, laying horizontal or blowing downhill? Is it plume dominated?
   b. Are there thunderstorms in the area?
   c. Is there increased turbulence when flying on the lee side of ridges or geographical prominences?

   Any of the above conditions may be an indicator of hazardous landing, rappelling, or firefighting conditions.

C Arrival on scene:

1. Check airspace for other aircraft before approaching fire area.

2. Establish & maintain positive ICS with pilot & IC. Inform dispatch of arrival.

3. Conduct high-level recon prior to transition to low-level recon. Look for wires, cables, telephone/power poles. Smoke and poor lighting conditions can make it harder to see wires. Small gauge wires may be difficult to see at any distance. If first entry into area, assume there are wires until proven otherwise.

4. Fire size-up
   a. Fire size?
   b. Position on slope?
   c. Fire actively spreading?
   d. Available fuels to allow fire growth?
   e. Potential for rapid fire growth due to weather, low fuel moisture, slope, or aspect?

5. Identify safety zone(s) and potential escape routes near fire or within burned area. Use guidelines from page 7 of Incident Response Pocket Guide.
   a. Before a burned area can be designated as potential safety zone:
      1) Most light fuels, including brush (if present), must have been consumed.
      2) The burned area must have cooled sufficiently to permit human occupation without excessive heat exposure.
      3) Smoke conditions in burned area must not exceed normal tolerable levels.

6. Identify helicopter landing site(s) near fire (if any).
a. Pilot and spotter confirm elevation and temperature, to assure payload is within load calculation parameters.
b. If uncertain about whether site is in ground effect or out of ground effect, assume site is out of ground until proven otherwise.

7. If needed, identify potential rappel sites near fire.
   a. Pilot and spotter confirm elevation and temperature, to assure payload is within load calculation OGE parameters.

Section 2: Deployment

D Risk decision-making priorities

Decision Point 2: Off-site landing area near fire, rapid engagement possible without helicopter or firefighters being exposed to unacceptable hazard from fire behavior:

1. Land helicopter and deploy firefighters unless micrometeorological conditions indicate marginal landing conditions at site. Consider that lee side winds/turbulence can negatively affect helicopter performance.

   a. Off-site landings carry an elevated degree of risk; site should be carefully evaluated prior to landing approach to confirm suitability as safe landing site. Pilot and spotter should mutually agree on suitability of site.
   b. Consider an HOGE high hover power check prior to landing at an altitude comparable to the site or greater. A positive rate of climb must be established without exceeding aircraft limitations.
   c. Dispatch should be contacted prior to landing to inform them of upcoming landing and location.
   d. Flight crew should continue to look for wires and other hazards until helicopter has landed.
   e. Rotor wash can cause snags to fall; if snags next to proposed landing site could potentially impact landing site, extreme caution should be used or an alternate site selected.
   f. Main & tail rotors must maintain adequate safety margin from rocks, brush, and trees on approach route, in landing area, and on departure route.
   g. Landing pad must be free of objects than could impact underside of fuselage.
   h. Landing pad must be large enough for skids/wheels and not excessively sloped.
   i. Dusty landing sites can produce brownout conditions, carefully evaluate and approach potentially dusty areas with caution.
**Decision Point 3**: No landing site immediately adjacent to fire:

1. If fire has minimal chance of fire spread and is not an immediate threat to firefighters, consider alternate landing sites an increased distance from fire.
   
   a. Can aircraft remain on scene while firefighters approach incident? If not, consider having the aircraft fly a bearing from the location of firefighters to the fire to insure firefighters know where the fire is.
   
   b. If near end of day, will firefighters be able to reach the fire before dark? If not, rappel may be preferred option.
   
   c. Can you shorten hiking time and minimize depletion of firefighter energy reserves by using cargo letdown to deploy cargo near fire?

**NOTE**: Option to land at site adjacent to fire not available, fire potential indicates need for rappel.

- If helicopter and rappellers are rappel equipped, go to Decision Point 4.
- If rappel configured, skip Decision Point 4 and go directly to Decision Point 5.

**Decision Point 4**: Off-site landing and reconfiguring for rappel mission:

1. If distance/terrain/fire behavior makes it unsafe or unfeasible for firefighters to hike from potential landing site(s) to fire, find landing site a safe distance from fire to rig for rappel. Off-site landings carry an elevated degree of risk; site should be carefully evaluated prior to landing approach to confirm suitability as safe landing site.

   a. Conduct high-level recon prior to transition to low-level recon. Look for wires, cables, and telephone/power poles. Smoke and poor lighting conditions can make it harder to see wires. Small gauge wires may be difficult to see at any distance. If first entry into area, assume there are wires until proven otherwise.

   b. Do not land helicopter if micrometeorological conditions indicate marginal landing conditions at site. Consider that lee side winds/turbulence can negatively affect helicopter performance.

   c. Consider an OGE high hover power check prior to landing at an altitude comparable to the site or greater. A positive rate of climb must be established without exceeding aircraft limitations.

   d. Dispatch should be contacted prior to landing to inform them of upcoming landing and location.
e. Flight crew should continue to look for other aircraft, wires and other hazards until helicopter has landed.

f. Rotor wash can cause snags to fall; if snags next to proposed landing site could potentially impact landing site, consider other sites.

g. Main & tail rotors must have maintain adequate safety margin from rocks, brush, and trees on approach route, in landing area, and on departure route.

h. Landing pad must be free of objects that could impact underside of fuselage.

i. Landing pad must be large enough for skids/wheels and not excessively sloped.

j. Dusty landing sites can produce brownout conditions, carefully evaluate and approach potentially dusty areas with caution.

2. Once on the ground, rappellers and spotter reconfigure helicopter and cargo for rappel.

a. If the pilot and spotter decide to not shut down while configuring for rappel mission, the pilot must remain at the controls.

b. The spotter and rappellers must be cognizant of the main/tail rotor while reconfiguring and rigging for the rappel mission. Flight helmets and PPE must be worn at all times if rotors are turning.

c. Crewmembers should not rush or cut corners while reconfiguring/rigging because rotors are turning or because they are concerned about the fire increasing in size while they are absent.

d. If doors need to be removed, they should be handled with great care.

1) The light weight and large surface area of doors makes them behave like sails. Rotor wash or wind can catch the door and unbalance the person who carries it. Crewmembers who remove or carry a door should always maintain a firm two-handed grip on it and be prepared for the wind to catch it.

2) After removal, the doors should be placed far away from the landing site and to the side of the approach/departure flight path so there is no chance that rotor wash will affect them while taking off or landing.

e. Ropes and Sky Genies rigged and checked by spotter.

f. Cargo secured and checked by spotter.

g. Rappellers and spotters put on harnesses and rappel gear.

h. Rappellers complete buddy checks.

i. Spotter performs pre-flight walk-around check of helicopter and landing site before completing rappeller checks.

j. Rappeller checks completed by spotter. Conduct last review with pilot and rappellers to insure nothing has been overlooked and everything is ready to go.

k. If external cargo system is used, spotter should watch external load during takeoff to insure skid clearance.

l. Establish & maintain positive ICS with pilot & rappellers. Dispatch should be notified of departure from off-site landing area and arrival back at fire.
3. Upon arrival back at the fire, check for other aircraft in fire area. Spotter, pilot and IC should re-evaluate fire and planned rappel site to determine if fire/micrometeorological conditions have changed significantly during time away from fire. If previous assessment is no longer valid, conduct new fire behavior/rappel risk assessment. If previous assessment is still valid and rappel can be conducted safely, go to Decision Point 5.

**Decision Point 5**: Ridge top rappel site available above fire, rapid engagement possible without firefighters being exposed to undue hazard from fire behavior:

1. Rappelling carries an elevated degree of risk; site should be carefully evaluated prior to final approach to confirm suitability as safe rappel site.

2. Conduct an HOGE high hover power check prior to rappelling at an altitude comparable to the site or greater. A positive rate of climb must be established without exceeding aircraft limitations.

3. Rappel at ridge top unless micrometeorological conditions indicate potential marginal hover conditions at site. In general, it is often easier to maintain a stable hover on a ridgetop than on a hillside or in a drainage.

4. Pilot and spotter select rappel site. An alternate emergency site should also be selected in the event a rappeller has to perform an emergency tie-off.

5. Rotor wash can cause snags to fall; if snags next to proposed rappel site could potentially impact area where ropes or cargo letdown line would be deployed, extreme caution should be used.

6. Dispatch should be contacted prior to rappelling to inform them of upcoming rappel and GPS coordinates if needed. Radio volume should be turned down during the rappel sequence.

7. If there are firefighters already on the ground, establish communications before proceeding. Advise them to remain away from rappel site and to not interfere or attempt to help until rappellers and cargo are on the ground and helicopter departs.

8. Main & tail rotor must maintain adequate safety clearance from terrain or trees.

9. Before ropes and rappellers are deployed, the spotter and pilot should reconfirm that hover is stable and power is still good. Pilot can elect to re-establish forward flight if aircraft performance indicators are marginal.

10. If pilot has difficulty establishing or maintaining a stable hover before ropes are deployed, pilot should inform spotter of need to re-establish forward flight. Pilot & spotter should jointly re-evaluate proposed rappel site and micrometeorological conditions.
conditions, re-entry into same site should occur only if conditions substantially improve.

**NOTE:** See Chapter 6 for information regarding Rappel Emergency Procedures

**Decision Point 6:** Rappel site available nearby but located above fire, fuel & weather conditions will create unacceptable hazard to firefighters:

1. Rappel beside or below fire unless micrometeorological conditions indicate potential marginal hover conditions at site. Apply rappel risk evaluation/mitigation process from risk Decision Point 4 (except for direction to use ridgetop rappel site).
   a. Downhill winds may invalidate normal assumptions about the bottom end of a fire being a safer place for firefighters to anchor and work.

**Decision Point 7:** No safe landing or rappel site:

1. Do not deploy personnel.

**Section 3: Post deployment/pre engagement**

1. After rappellers complete rappel, the Incident Commander (IC) or Rappeller-In-Charge (RIC) should immediately contact spotter by radio to confirm rappellers are OK.

2. IC/RIC should perform a rapid risk assessment of fire hazard, confirm safety zone(s) and escape routes are viable, and share that information with other rappellers.

3. The spotter should confirm that the IC/RIC has established positive radio communications with dispatch before helicopter departs area. If positive radio communications cannot be established between firefighters on ground and dispatch, firefighters should not engage the fire.

Before engaging the fire, IC or RIC should perform a risk assessment using the risk management process from the Incident Pocket Response Guide. Other firefighters should participate in this process; the results should be shared with all present.
Appendix N – Rappel Activities in Support of Extended Attack or Large Fire Operations

Integration of rappel activities into the often complex airspace associated with extended attack and large fire operations necessitates additional risk and operational planning and logistical support in order to assure the safety of personnel. While working on extended attack and large fire incidents where rappel operations are planned or a possibility of rappelling exists the following conditions shall be met:

- Planned rappel operations (operational and proficiency) shall be identified in the Incident Action Plan in the ICS-220 and the ICS-204 for the division where the rappel operation is planned to occur.

- Preplanning for emergent situations in which rappel operations might be utilized (Medivac, IA within the incident response zone, Crash Rescue, etc.) will be completed, documented with review by the highest level aviation position assigned and approved by the Operations Section Chief (OSC) or IC and briefed to all involved.

- An operational risk assessment will be completed as appropriate by the manager and briefed to all involved prior to each operation. (Each operation may include multiple loads of rappellers.)

- Planning for proficiency rappels shall include incident aviation management staff and the OSC. Consider conducting proficiency rappels away from the helibase in order to prevent distractions to the helibase operations and rappel modules.
IHRG Appendix O - Rappel Equipment How To’s

- How to Attach BD Bag Click Lock Buckle Adapter – O1
- How to Attach Rappel Spotter Tether to Miller Harness – O2
- Rappel and Spotter Harness Knife Sheath Installation – O3
How to Attach BD Bag Click Lock Buckle Adapter

To Rappel Harness
Step 1: Position Buckle adaptor in correct position on HR-2 harness.
Step 2: Route buckle through loop end
Buckle Adapter

Step 3: Work buckle/loop around until buckle end points toward inside. No tacking or other fasteners are needed to keep the buckle in the correct location.

Installation complete
Extendable Tether Tacking

Step 1: Insert free end of tether through adjuster as shown. Pass end of tether through underside of harness D ring.
Extendable Tether Tacking

Step 2: Pass tether end through harness D ring and back through adjuster, leaving about 4” of end tab below adjuster.
Step 3: Fold free end back over bottom bar of adjuster and under top bar of adjuster, leaving about 2’ of end tab above adjuster. Using nylon 5 cord and large gauge needle, pass needle down through locking tab and the outer webbing of the adjustment loop, then back up through both webbing layers.
Extendable Tether Tacking

Step 4: Bring doubled ends of nylon 5 cord together and tie square knot in center. Trim ends leaving about 1” tails.
Extendable Tether Tacking

Underside of tacking should appear as in photo above. The tether length may be shortened by pulling slack from the underside, or lengthened by sliding the adjuster to the desired length. The tacking does not need to be removed in order to adjust tether length. Spotters and rappellers should inspect tacking when conducting spotter equipment checks.
Rappel and Spotter Harness

Knife Sheath Installation
Harness Knife Installation

Figure 1: The sheath on the left with the single vertical piece of black webbing is designed for the HR-2 harness. The sheath on the right with two horizontal black pieces of webbing is the spotter harness version.
Figure 2: Rappeller version of Raptor knife sheath comes with one end of the “belt loop” webbing already attached. It is acceptable to use either a standard industrial type sewing machine or a bartack sewing machine.
Figure 3: Rear view of sheath and harness. Place black 1” webbing “belt loop” over 1 ¾” black harness webbing between leg strap pad and leg snap attachment webbing. Sew 1” webbing to back side of sheath even with lanyard bartack and above top of lanyard stow pouch. DO NOT SEW TO HARNESS WEBBING. When the 1” webbing is correctly attached, the leg strap pad and leg snap attachment webbing will keep the sheath in the correct location but will allow the rappeller to adjust its location for comfort when seated.
Harness Knife Installation

Figure 4: Front view of sheath and harness after attaching 1” webbing “belt loop”. Note finger pointing to bartack above lanyard stow pouch.

Figure 5: Lanyard being “S” folded and stowed in lanyard stow pouch. Note knife is placed in sheath first to prevent cutting lanyard or harness.
Figure 6: When the lanyard is correctly stowed, the only part of the lanyard that should be visible is the end sewn to the knife handle. After closing end flap with dot snaps, knife is ready to use.

Figure 7: Photo showing correct sheath position.
Harness Knife Installation

Figure 9: The orientation of the sheath should be upside down for easy access to the spotter in an emergency. Before tacking the loops in place, insure the sheath’s location will be correct when the harness is worn. Sewing loose ends of the horizontal loops to the edge of the sheath, using a bartacker.

Figure 10: Raptor knife spotter’s sheath attached to the Miller harness. Spotters may opt to remove the lanyard from the spotter knife/sheath if they prefer.