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USDA Forest Service - National Rappel Operations Guide Approval

Prepared by:

/s/ Chad Schmidt  
Date: 3/20/2019

Chair, National Rappel Operations Subcommittee

Chad Schmidt

Prepared by:

/s/ Orion Davidson  
Date: 3/20/2019

Chair, National Rappel Training Subcommittee

Orion Davidson

Reviewed by:

/s/ Eric J. Bush  
Date: 3/21/2019

Chair, National Rappel Working Team

Eric J. Bush

Recommended by:

/s/  
Date: 4/12/2019

Assistant Director, Aviation

Jeff Power

Approved by:

/s/  
Date: 4/16/2019

Director, Fire & Aviation Management

Shawna Legarza
USDA Forest Service - National Rappel Operations Guide Overview

The U.S. Forest Service National Rappel Working Team (NRWT), National Rappel Operations Subcommittee (ROS), and the National Rappel Training Subcommittee (RTS) have developed this guide for agency employees conducting Forest Service helicopter rappel operations.

The NROG is available on the National Rappel Program SharePoint site and from the U.S. Forest Service Fire and Aviation website at:

https://www.fs.fed.us/managing-land/fire/aviation/publications
**USDA Forest Service Helicopter Rappel Mission Statement**

The U.S. Forest Service National Helicopter Rappel Program’s primary mission is initial attack. Rappel crews may be utilized for large fire support, all-hazard incident operations, and resource management objectives.
NROG Revision Summary

This list summarizes the latest revisions made to the National Rappel Operations Guide. It does not include formatting changes, minor edits such as capitalization, punctuation, or spelling corrections, or rewording for clarity that does not change meaning or intent.

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<th>Section</th>
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<tr>
<td>Ch. 5 (F) Buddy Check</td>
<td>Alignment with Appendix A procedures as approved through rappel equipment transition team and Rappel Training Subcommittee.</td>
<td>4-2019-1</td>
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<tr>
<td>Ch. 5 (G) Boarding Sequence</td>
<td>Alignment with Appendix A procedures as approved through rappel equipment transition team and Rappel Training Subcommittee.</td>
<td>4-2019-2</td>
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<tr>
<td>Ch. 5, V (B) In-Flight Procedures</td>
<td>Alignment with Appendix A procedures as approved through rappel equipment transition team and Rappel Training Subcommittee.</td>
<td>4-2019-3</td>
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<tr>
<td>Ch. 5, VII (E) Cargo Deployment</td>
<td>Cargo Deployment Procedures, clarified closing of door sequence while in area of operation (post cargo delivery).</td>
<td>4-2019-4</td>
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<tr>
<td>Ch., IV Rappeller (D) Performance-Based Requirements</td>
<td>Added: Rappel Base Managers shall complete Appendix N, Annual Crew Status Report. The completed report shall be provided to the local fire leadership, Regional Helicopter Operations Specialist, and the National Rappel Specialist by April 15.</td>
<td>6-2021</td>
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| Ch. 2 Administration (I) Organization, Personnel, Staffing, and Standards | The equipment chapter received a full-review from the Rappel Equipment Specialist, National Rappel Specialist, and the Rappel Training Subcommittee. Chapter 4 changes are as follows:  
  - Added Rappel Equipment Age-based Retirement Table  
  - Corrected Tech Tip and OHSA reference numbers  
  - Metolius Climbing ¾ and Full Finger Glove are approved for cargo letdown operations. The Metolius ¾ Finger Glove shall only be used in conjunction with a flight glove.  
  - The Sullivan (short and PVG (gauntlet), | 6-2021 |
and Metolius full finger belay gloves are approved for wildland-fire rappel operations.

- Each ARS Anchor shall have a date stamp or tag and will have a life cycle of 5 years from the date of manufacture.
- Rope cleaning: Rope brushes may be used (examples are CMI or PMI Rope Washers).
- Rope Inspection: ... To inspect, 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, sheath creep, burrs, or anything out of the ordinary.
- Rope Service Life Factors: Added During operational hours ropes and rappel gear may be placed in ready-lockers, or up-load racks as long as they are out of direct sunlight.
- Descender Inspection: Added: There is no age-based retirement for the descender.

D4 Endurance Inspection criteria.

Ch. 5, Rappel and Cargo Letdown Operations

Rappel Sequence

- #16 Spotter gives Move to Skid hand signal to each rappeller. Rappeller moves to the skid, squares up with rope on right side of body, with left hand moves descender handle to “primed position”, visually clears rope to the ground, visually inspects descender, places right hand on rappeller tether release, returns eyes to spotter in ready position.
- #20 Rappellers release rappeller tether, begins transitioning off skid looking at the anchor. Continue transition to an inverted state.
- #21 Once off skid, stop, ensure rope is over the lip, and descend to ground while maintaining on-rope situational awareness.
- #22 Spotter keeps pilot apprised of the helicopter positioning, rappel site, and rappellers’ progress down the rope; states to pilot, “Rappellers off the skid ... half-way ... on the ground.”
<table>
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<th>Description of Change</th>
<th>Tracking #</th>
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<tr>
<td>Ch. 5, D. Pre-Cargo Delivery Sequence</td>
<td>10. Spotter rigs figure eight with cargo letdown line and attaches figure eight using one carabiner in the aft slot of the anchor bracket</td>
<td>6-2021</td>
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<tr>
<td>Ch. 6, I. Rappeller Emergency Procedures and Signals</td>
<td>ETO procedures (d.) Move rope to left side of body, remove knife, cut the running end of rope approximately 3-4 feet below the descender.</td>
<td>6-2021</td>
</tr>
<tr>
<td>Appendix A, Initial Rappeller Training, and Veteran Rappeller Training</td>
<td>Reviewed and revised throughout. Current version placed in the 2019 NROG folder on SharePoint</td>
<td>6-2021</td>
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<tr>
<td>Appendix C, Forms</td>
<td>Reviewed and Revised. Current version placed in the 2019 NROG folder on SharePoint</td>
<td>6-2021</td>
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<tr>
<td>Appendix N, Annual Rappel Crew Status Report</td>
<td>NEW Appendix.</td>
<td>6-2021</td>
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Chapter 1. Introduction

I. Objective

This guide provides standards for the administration of all rappel units regarding personnel qualifications, organization, certification, standardization, training, equipment and operating procedures. Managers, specialists and technicians shall use this guide in planning, administering and conducting rappel and cargo letdown operations.

II. Scope

The procedures contained in this guide apply to rappel operations conducted by Forest Service rappel bases. The level of standardization is determined by the Forest Service National Rappel Working Team (NRWT).

III. Policy

All Forest Service rappel bases have similar administrative technical requirements for rappel and cargo letdown operations. Operations and procedures shall comply with agency policy, procurement documents, and this operating guide.

IV. Authority

This guide has been submitted by the Rappel Operations Subcommittee (ROS) and the Rappel Training Subcommittee (RTS) to the NRWT for review and concurrence. This guide has been approved by the Director, Fire and Aviation Management. Host regions and forests are responsible for ensuring rappel bases, spotters and rappellers, under their management, meet national standards for rappel training and operations. Line officers shall ensure that only qualified personnel supervise and administer rappel operations. Rappel base managers shall ensure operational safety and compliance with standards, equipment and procedures.

V. Standardization of Equipment and Procedure

The total mobility and the interchange of personnel and equipment between units (“boosting”) dictates that personnel qualifications and training, equipment, rappel and cargo letdown delivery methods, and operating procedures must be uniform and standardized. This guide lists standardized training, equipment and procedures for uniform, service-wide application. The Washington Office will have the final approval for new equipment and procedures before they are adopted for service-wide use.
VI. Review and Revision

Users are encouraged to recommend changes to this guide through their respective rappel base manager via written proposal (see Appendix C - Forms). The rappel base manager submits the proposal to the rappel operations or rappel training subcommittee chairperson for group review, concurrence, recommendation, and where applicable, forwarding to the NRWT.

The NRWT may approve proposals and make minor edits to the NROG at any time without further director approval, as long as it does not change meaning or intent. Rewording for clarity, formatting, grammar and spelling changes are examples of minor changes.

Proposals to revise or modify contents of the NROG deemed significant, e.g. life-bearing equipment change, national-level programmatic change (addition or reduction of rappel crews, national budget allocation, and crew size standard), or rappel aircraft change (make and type) shall be reviewed by the Rappel Operations and Rappel Training Subcommittees by November 1 each year. The NRWT shall review the proposal(s) by December 15 with adoption of change contingent on director approval.

Edits deemed significant, that change meaning or intent, shall be tracked on the NROG revision form on page ii of this guide.

Interim revisions (those that occur within the revision cycle) may be necessary. Interim revisions are available on the National Rappel Program SharePoint site and from the US Forest Service Fire and Aviation website at:

https://www.fs.fed.us/managing-land/fire/aviation/publications

The NROG shall receive a complete review every three years. The NRWT forwards recommendations to the Assistant Director, Aviation, for review. The Assistant Director, Aviation forwards recommendations to the Director, Fire and Aviation Management for approval. Revisions will be distributed by the Forest Service National Aviation Office.

VII. Disclaimer

The use of trade, firm, product, company or corporation names is for informational and convenience purposes. Such use does not constitute an official evaluation, conclusion, recommendation, endorsement or appraisal of any product or source to the exclusion of others that may also be suitable.
Chapter 2. Administration

I. Organization, Personnel, Staffing and Standards

The rappel program shall maintain a high operating standard led by competent and qualified personnel. It is essential that program leaders are supported locally to ensure staffing levels are aligned with standards set forth in this chapter. Rappel Base Managers shall complete Appendix N, Annual Crew Status Report. The completed report shall be provided to the local fire leadership, Regional Helicopter Operations Specialist, and the National Rappel Specialist by April 15.

A. Unit Organization

Rappel crews shall be managed and supervised by the local unit. This supervision should be provided from a forest-level fire manager or aviation officer rather than from a district-level manager.

Each rappel base shall be staffed to effectively supervise the base’s activities. The staff at permanent bases shall include one base manager, and one or more persons to oversee the following functional areas: operations, equipment and training.

The base organization shall be structured to provide an adequate ratio of managers and assistant managers to squad leaders, and squad leaders to rappellers. Each unit requires a minimum of one squad leader for every five rappellers. Depending on the size, workloads, and responsibility of each unit, additional positions should be established to ensure that all areas of responsibility receive the necessary supervision. Some or all of these positions may require full-time employees to obtain the skill levels necessary to accomplish the job.

The number of qualified spotters should be sufficient to staff the available aircraft fleet. Two spotters per rappel helicopter is the recommended minimum with three or more as the desired target. Organization structures should also strive to provide a clear and attainable career ladder whenever possible.

B. Overhead Personnel Staffing Requirements

National standard position descriptions for helicopter positions are available and should be used by all rappel units. While organizational structures may vary among rappel bases due to size and complexity, each organizational unit should provide qualified personnel to manage a number of functional areas. The following describes these key functional areas and general responsibilities:

1. Rappel Base Manager

The rappel base manager should have administrative and rappel experience and be thoroughly familiar with aircraft operations and all phases of helicopter rappelling. This individual is responsible for all administrative, facilities, preparedness and fire operations at the rappel base.
2. Operations Manager

The operations manager maintains standardized procedures in rappel operations, organizes project work, and keeps records for all rappeller activities. In some organizations, this individual also may serve as training manager and/or equipment manager. The individual responsible for this position or functional area reports to the base manager. The operations manager must be an experienced rappel spotter and must remain an active rappel spotter.

3. Training Manager

Larger organizations may need a training manager responsible for the various training activities of a rappel unit. In most organizations, the training manager reports to the base manager. This individual must be an experienced rappel spotter and must remain an active spotter. Some bases may combine this position with the operations manager position.

4. Equipment Manager

The equipment manager is responsible for maintaining helicopter rappel-related equipment and reporting deficiencies. Depending on the complexity of the aviation operation, not every base will require a dedicated equipment manager and these responsibilities may be assigned to another functional area manager. This individual must be an experienced and active rappel spotter. The equipment manager will:

a. Provide technical assistance to the base manager
b. Maintain base supplies and rappel equipment
c. Supervise equipment repair and manufacture as applicable
d. Assist the National Technology and Development Program (NTDP) in testing and development of rappel equipment as requested

5. Assistant Manager

The assistant manager reports directly to the GS-9 rappel base manager and may serve in an acting capacity. On larger crews, where the rappel base manager is a GS-11, the assistant reports directly to the GS-9 crew supervisor. The assistant may perform operations, training, or equipment manager duties as designated on the base organizational chart. This individual is a qualified rappeller and should be supported in attaining a spotter qualification.

6. Clerical Personnel

Each organization, depending upon administrative complexity and need, should have a clerical assistant assigned to assist the base manager with administrative responsibilities at the base.
C. Crew Organization

1. Crew Size

   Crew size shall be a minimum of 15 people per rappel helicopter. An 18 or 21-person crew size is the recommended standard to increase IA capability, provide additional leadership to the crew, and add greater flexibility that will allow for off-crew training opportunities to advance operational and aviation qualifications. Rappel module size may increase above the minimum recommended levels depending on funding, size of facilities, local management, and regional/national needs.

2. Span of Control

   Rappel crew modules shall adhere to the ICS span of control for supervision, which ranges from three to seven subordinates for each supervisor. Because span of control is influenced by the size, complexity, and specific hazards of the incident or operation, a ratio of one supervisor/leader to five subordinates is most often recommended and should be the target for each rappel crew.

3. Crew Configurations

   The tables below show the minimum 15-person crew configuration and the recommended 18 or 21-person crew configuration. These module configurations are for single helicopter rappel crews and were developed with the target span of control in mind. The Rappel Program supports the Fire Apprenticeship Program however, it is recommended that apprentices be in-addition to the rappel crew baseline staffing structure.
a. Minimum Standard 15-Person Crew Module

<table>
<thead>
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<th>Position Description</th>
<th>Grade</th>
<th>Minimum Tours</th>
<th>Number of Position</th>
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<td>Helitack Manager FS1920</td>
<td>GS-09</td>
<td>26/0</td>
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<td>Helitack Asst. Mgr. FS1918/FS1919</td>
<td>GS-07/GS-08</td>
<td>18/8 Minimum</td>
<td>1</td>
</tr>
<tr>
<td>Squad Leader FS1986/FS1987</td>
<td>GS-06/GS-07</td>
<td>13/13 Minimum</td>
<td>2</td>
</tr>
<tr>
<td>Senior Firefighter FS0199/FS0200</td>
<td>GS-04/GS-05</td>
<td>13/13 Minimum</td>
<td>4</td>
</tr>
<tr>
<td>Senior Firefighter FS0199/FS0200 or Apprentice AR5767/AR5768</td>
<td>GS-04/GS-05</td>
<td>13/13 Minimum</td>
<td>3</td>
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<tr>
<td>Firefighter FS0199/FS0200</td>
<td>GS-04/GS-05</td>
<td>Temporary</td>
<td>4</td>
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b. Recommended Standard 18-Person Crew Module

<table>
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<th>Position Description</th>
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<th>Minimum Tours</th>
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<tr>
<td>Senior Firefighter FS0199/FS0200</td>
<td>GS-04/GS-05</td>
<td>13/13 Minimum</td>
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</tr>
<tr>
<td>Senior Firefighter or Apprentice</td>
<td>GS-04/GS-05</td>
<td>13/13 Minimum</td>
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<tr>
<td>Firefighter</td>
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### c. Recommended Standard 21-Person Crew Module

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Chapter 3. Rappel Position Standards

I. Rappel Pilot Training Requirements

Pilots must meet the appropriate requirements of the contracting document and shall receive training on rappel operations and equipment as listed below. Pilots needing initial rappel certification shall attend a consolidated training session. Vendors may request approval from their designated base COR or base manager if an alternate date is necessary for a pilot who is unable to attend a consolidated rappel session for an initial rappel evaluation, i.e. emergency situation or illness.

The pilot will be evaluated and approved by an agency helicopter inspector pilot for rappel and cargo letdown in accordance with the Interagency Helicopter Pilot Practical Test Standards.

A. Pilot Rappel Training Syllabus

1. Crew resource management discussion with rappel program-specific emphasis
2. Review of operational risk management concepts and tools e.g., GAR model
3. Orientation of unit and agency fire suppression organization, dispatch organization, and communications
4. Briefing and familiarization on rappel anchor and hardpoint for specific model including maintenance inspection procedures
5. Briefing and demonstration of rappel equipment, accessories, and PPE
6. Seating arrangements for rappellers and spotters
7. Standard IA configuration and deployment procedures
8. Cargo placement, loading, securing, rigging and letdown procedures
9. Helicopter mock-up training to include cargo letdown, rappel sequence, rappel emergency procedures simulation, and helicopter emergency procedures
10. Expectations for pre-rappel mission briefing
11. Review rappel site selection criteria including:
   a. Personnel
   b. Safety zones
   c. Fire behavior
   d. Emergency fly-away site, helicopter clearance, and ability to land rather than rappel

IMPORTANT NOTE: The certifying official at each level may require additional training for pilot, check spotter, spotter or rappeller.
12. Pilot and spotter protocols and responsibility to cancel any mission deemed unsafe or too high risk

B. Approval

1. Pilot’s final approval for rappel operations will be based upon:
   a. Completion of spotter-provided briefing and training
   b. Demonstrated ability to pilot the helicopter during a series of rappels and cargo letdown operations. Pilot’s focus will be on spotter direction and aircraft health and stability, not on vertical reference placement of the rappellers
   c. Demonstrated ability to coordinate with rappel spotter
   d. Demonstrated knowledge of rappel emergency procedures during emergency procedures simulation and the aircraft emergency procedures’ effect on rappel operations
   e. Demonstrated ability to perform weight and balance computations (including center of gravity) for rappel configurations

C. Pilot Currency

To maintain currency, each pilot must fly at least one error-free helicopter rappel sequence within the preceding 21 days. If currency is lost, an error-free mockup and helicopter rappel sequence flight must be completed prior to any operational rappel. If a total of 28 days pass, the spotter, with the concurrence of the helicopter inspector pilot (HIP), will ensure the pilot is capable of deploying rappellers through the use of mockups and currency rappel flights.

IMPORTANT NOTE: Check spotters may suspend spotter or rappeller qualifications pending review of the next higher certifying level. Revocations of spotter and rappeller qualification will be determined at the appropriate Regional or National Aviation Office.

II. Rappel Check Spotter

A. Rappel Check Spotter Duties

1. Initial spotter evaluation and certification
2. Monitor and provide oversight for rappeller and spotter training
3. Monitor operations for standardization purposes

B. Rappel Check Spotter Prerequisites

1. Must have been a qualified spotter for three seasons
2. Must have demonstrated ability as a lead instructor at national rappel training sessions, of which at least one is an initial rappeller training

C. Rappel Check Spotter Designation

Approval of check spotters shall be designated annually by the national rappel specialist as requested by the regional helicopter operations specialist.

D. Rappel Check Spotter Proficiency

To maintain currency, each check spotter must maintain currency/proficiency as a rappel spotter (see Section III, G, of this chapter).

E. Rappel Check Spotter Annual Certification

Each check spotter must be certified as a rappel spotter (see Section III, E, of this chapter).

III. Rappel Spotter

A. Rappel Spotter Duties

1. Safely deploy rappellers according to policy outlined in this guide
2. Ensure only standard procedures and equipment found in this guide are used and followed
3. Provide initial and recurrent training and certifications for rappellers. Provide training in accordance with the Helicopter Rappel Spotter Qualification Record.

B. Rappel Spotter Prerequisites

1. Trainee rappel spotter prerequisites:
   a. One fire season (90 days) on a helicopter rappel crew
   b. Currently qualified as a helicopter manager
   c. Completion of 20 live rappels, with four of those being operational
   d. Other recommended training: M-410 or equivalent, contracting officer representative training, and operational risk management training
   e. Ride-along on rappel and/or cargo missions
   f. It will be the responsibility of the base manager, with concurrence of a check spotter, to designate initial spotter trainees

2. Rappel spotter certification prerequisites:
   a. Currently qualified as a helicopter manager
   b. Currently qualified as an incident commander type 4
   c. Has assisted in instruction of rappel training
   d. Completion of Forest Service-certified CRM course in accordance with FSH 5709.16, Ch.20, 21.1, 8 and 21.6
C. Rappel Spotter Training

Rappellers meeting the spotter prerequisites are encouraged to submit a nomination for the annual National Rappel Spotter Immersion Academy and request initiation of a Helicopter Rappel Spotter Training Qualification Record through their first-line supervisor. A spotter trainee is not required to attend the spotter immersion academy, however, they shall follow the same training curriculum found in Appendix B.

Complete the Helicopter Rappel Spotter Training Qualification Record and pass a final evaluation administered by a qualified check spotter. A spotter trainee will have no more than two opportunities to pass a check ride per season. Trainees’ future status will be determined (i.e. continue or discontinue training) and documented by majority of available check spotters. Check spotters shall notify candidate’s base manager prior to evaluation and RTS post evaluation.

D. Rappel Spotter Initial Certification

The spotter trainee shall recertify as a rappeller, complete all training requirements as a spotter, be recommended for certification by a check spotter, be reviewed by the regional helicopter operations specialist, and be certified by the local unit official. The national rappel specialist shall be notified upon certification.

E. Rappel Spotter Annual Certification

Annual spotter certification requires training and demonstration of competency.

1. Each year, to obtain annual certification, a spotter must:
   a. Obtain annual certification as a rappeller
   b. Maintain Forest Service CRM currency in accordance with FSH 5709.16, Ch.20, 21.1, 8 and 21.6
   c. Complete annual certification as outlined in the Annual Spotter Certification Training Record
   d. Complete deployment of three typically-configured loads of rappellers with at least one successful deployment of rappellers and cargo from helicopter to the satisfaction of a qualified check spotter. Typical terrain and a full complement of initial attack cargo shall be utilized for at least one of the three loads.
   e. A spotter will have no more than two opportunities to obtain annual certification. After the second failed check ride, a spotter will not be an active spotter for that operational season.
F. Spotter Trainee Annual Certification

Spotter trainees need to meet all annual certification requirements as a rappeller. Additionally, a spotter trainee that is approved to spot operationally shall perform three live spots with a qualified spotter in typical terrain, one of which shall be with a check spotter.

1. If trainee is approved to spot live, they must complete annual certification as outlined in the Annual Spotter Certification Training Record

2. Spotter trainees who are not approved to spot live will continue as directed in the Spotter Trainee Qualification Record

G. Rappel Spotter Currency

To maintain currency, each spotter shall make at least one error-free helicopter spot in any 14 consecutive days. If a simulator or mockup spot is used to maintain currency during any 14-day period, a helicopter spot must be completed during the next 14-day cycle. If currency is lost, an error-free mockup and helicopter spot must be completed prior to any operational spots. If two currency periods pass (28 days), a qualified spotter will ensure the spotter is capable of performing the spot through the use of mockups or training spots.

H. Rappel Spotter Lapsed Annual Certification

If a spotter has lost his/her annual certification for a time period of two operational seasons (skipped two seasons of certification), the individual shall complete rappel spotter annual certification requirements (see Section III, E above) and will operate under direct supervision of a qualified spotter for a time period determined by a check spotter. A check spotter may use past performance and experience as a means to determine an acceptable time period.

After performing under supervision for the prescribed time period, a formal check ride will be conducted utilizing the Spotter Training Handbook Final Sign-Off Sheet. It is recommended that the check ride occur on an operational rappel. If the individual fails the check ride, he/she will be required to begin spotter training as an initial spotter candidate.

If a previously qualified spotter has not been certified in the three previous operational seasons, the individual will begin spotter training as a new spotter candidate in accordance with Section III, C and D above.

IV. Rappeller

A. Rappeller Prerequisites

For consideration as a rappeller, a rappeller candidate must meet the requirements for a helicopter crewmember trainee as stated in Forest Service policy.
B. Rappeller Initial Training  
All components of the rappel training must be completed in accordance with Appendix A (Initial) of this guide, and shall be documented on the Initial Rappeller Training record in Appendix C.

C. Rappeller Annual Certification  
All components of the annual rappel training must be completed in accordance with Appendix A (Veteran) of this guide, and shall be documented on the Annual Rappel Certification record in Appendix C.
1. Participate in an equipment and procedures review  
2. Demonstrate knowledge of rappel principles  
3. Complete the performance-based requirements  
   a. If a veteran rappeller commits a major penalty during live rappels in a vet re-certification, the rappeller will be removed from that consolidated training session. Based upon past performance, the error committed, and spotter/check spotter discretion, the rappeller may be given a second opportunity at the next available consolidated training session. This will be the last opportunity to re-cert for a given year. If a second major is committed, the rappeller will not be certified to rappel that season.
D. Rappeller Currency

To maintain currency, each rappeller shall make at least one error-free helicopter rappel, helicopter mock-up, or simulator rappel in any 14 consecutive days. If a simulator or mockup is used to maintain currency during any 14-day period, a helicopter rappel must be completed during the next 14-day cycle. If currency is lost, an error-free simulator rappel or mockup and a helicopter rappel must be completed prior to any operational rappels. If two rappel periods pass (28 days), a qualified spotter will ensure the rappeller is capable of performing the rappel through the use of mockups and training rappels.

E. Rappeller Mid-Season Error

If during the operational season 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 A, Rappeller Training Syllabus, Lesson One, 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 the base, the rappeller will be debriefed and placed in loss-of-proficiency status. The major error must be reviewed by the rappeller’s supervisor and a check spotter. The rappeller may regain operational status once proficiency performance elements are met (this may include additional live rappels).

Based upon the rappeller’s demonstrated ability and record of errors, a check spotter may suspend the rappeller from further rappel operations (see note box, Chapter 3, II). Once suspended, the rappeller will not be eligible for reinstatement during that calendar year and may only regain certification by attending annual certification training in a subsequent year.

b. Mid-season minor:

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

F. Rappeller Lapsed Annual Certification

If a rappeller has lost his/her annual certification for more than two consecutive operational seasons, that individual may recertify as a rappeller by attending a consolidated rappel training session and completing the requirements for rappeller annual certification (see Appendix A, Rappeller Training).
If a recertifying rappeller cannot consistently demonstrate proficiency during the rappeller annual certification training, the individual may only be recertified by the successful completion of rappeller initial training requirements (see Chapter 3, IV, B above).

If three or more consecutive seasons elapse since the individual’s last certification as a rappeller, the individual shall complete rappeller initial training requirements at a consolidated rappel training.

G. Rappeller Fitness Standards

All rappellers must meet Office of Personnel Management Qualification Standards Handbook requirements for positions under the General Schedule. In addition, these individuals must meet the following annually:

a. Current requirements for medical standards

b. Rappeller candidates must pass the Work Capacity Test at the arduous level

H. Desired Fitness Goals

Physical fitness is a core value of the rappel program. Training to build strength and cardiovascular endurance should be a component of preseason and seasonal training.

All rappel personnel shall maintain a high fitness level and be able to perform all physical tasks that are necessary to accomplish the rappel and firefighting mission.

a. It is recommended that all personnel perform the elements listed below as a way to measure cardio-respiratory endurance and muscular fitness.

   i. 1.5-mile run in 11 minutes
   ii. 25 push-ups in 60 seconds
   iii. 7 pullups
   iv. 3-mile, level terrain, pack-out with 85 lbs. in 90 minutes or less
Chapter 4. Rappel and Cargo Letdown Equipment

I. Equipment Standards

All equipment used in rappel operations will be approved by the National Rappel Working Team. All equipment will be monitored during use for wear and stress-related damage. Shortening the service life or removing a component from service may be done as necessary to maintain an adequate margin of safety within the program.

A Rappel Equipment Inspection Form shall be maintained for the life cycle of the rappel rope, descender, rappeller tether, rappel harness, spotter harness (including extendable tether), spotter anchor, and cargo letdown line.

Any equipment irregularities must be reported in accordance with Appendix E, Rappel Equipment Irregularity Reporting Protocols.

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 (Descenders should be removed from service and recycled). All rappel equipment that has been retired remains government property and should be handled according to policy.

All proposed rappel aircraft shall be subject to a screening and evaluation process, to be completed by the Helicopter Screening and Evaluation Board (HSEB).

II. Rappel Platform Training Simulator

A rappel platform simulating the cabin area, seating positions, and skid heights of the helicopter will be utilized to train rappellers.

A. Tower and Simulator Requirements

1. A minimum height of 20 feet above ground level. Rappeller experience will be greatly enhanced from a higher platform

2. The tower, stairs, platform, and handrails, shall meet agency and OSHA requirements for construction (Walking-WorkingSurfaces/1910)
3. The rappel anchor and spotter tether anchor must meet OSHA standards for fall arrest (Safety belts, Lifelines and Lanyards/1926.104)

4. Rappel tower should be inspected annually and daily before any use. A program manager may delegate inspections. Example inspection forms can be found in Appendix C

III. Individual Rappeller/Spotter Equipment

<table>
<thead>
<tr>
<th>Rappel Equipment Age-based Retirement Table</th>
<th>10 years from the date of manufacturing (DOM)</th>
<th>5 years from in-service date (DOM if in-service is unknown)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rappel Harness</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Spotter Harness</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Extendable Spotter Tether</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Letdown Line</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Cargo Restraints</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Cargo Harnesses / soft loops</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Rappel Rope</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Rappeller Tether</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>ARS Spotter Anchor</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

A. Nomex Clothing and Boots

Spotters and rappellers shall wear a Nomex shirt and Nomex pants or a Nomex flight suit for rappelling operations. If wearing a Nomex flight suit while rappelling, clothing under the flight suit shall be dictated by mission requirements (e.g., fireline PPE). Boots shall meet National Fire Protection Association (NFPA) standards for fireline operations (see FSH 6709.11, Chapter 20 for boot standards).

B. Helmets


C. Eye Protection

For any rappel operation, rappellers must wear eye protection that meets ANSI Z87.1. A flight helmet with the visor down meets this requirement.
D. Gloves

1. Spotters shall, at a minimum, wear approved flight gloves. For additional heat protection, spotters may wear a rappel-type glove for cargo letdown. The Sullivan PV (short) glove, the Sullivan PVG (gauntlet) glove, the PMI GL2200 Lightweight Rappel Glove, and the Metolius Climbing ¾ and Full Finger Glove are approved for cargo letdown operations. The Metolius ¾ Finger Glove shall only be used in conjunction with a flight glove.

2. Rappellers gloves shall be leather and provide sufficient heat protection during a rappel descent. The Sullivan short and PVG (gauntlet), and Metolius full finger belay gloves are approved for wildland-fire rappel operations.

3. Inspection:
   a. Inspect stitching for abrasion and wear
   b. Leather should be free from cuts or holes. Pay special attention to the area between thumb and forefinger
   c. Leather should be inspected for oils, pitch or other contaminants
   d. Hook and loop Velcro should adhere well when pressed together
   e. Gloves must be inspected by user prior to each use
E. Belly Deployment (BD) Bag

1. Criteria:

   BD bag must be constructed in accordance with drawing #MTDC-1115. The maximum weight of the BD bag shall not exceed 30 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 according to the directions in Appendix F - Specified Equipment Attachment Standards. Loose straps must be secured to prevent entanglement during the rappel process.

2. Inspection:

   a. BD bags must be inspected by user prior to operation
   b. Inspect stitching and fabric for abrasion and wear
   c. Zipper should function properly and store completely in pocket
   d. Check to ensure all buckles function properly

F. Required Minimum Personal Rappeller Equipment

1. 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/sleeping bag
   i. Food (1 meal)
   j. 1 fusee
   k. Line gear
   l. BD bag

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

   a. Radio (Best practice: Each rappeller is issued a radio)
   b. Compass
   c. Map of the area or GPS with appropriate maps installed.
g. **Required Minimum Rappeller Initial Attack Cargo Equipment List**

1. In addition to the items carried by each rappeller, the following items shall be packed into an approved container and delivered to each stick of rappellers:

   a. Food for 36 hours
   b. 3 gallons of water
   c. 2 hand tools
   d. 1 tent fly (9’x10’)
   e. 1 roll of toilet paper
   f. 6 trash bags
   g. 1 first-aid kit
   h. 2 pack-out bags
   i. 1 water treatment
   j. 1 box (24) AA batteries
   k. 2 rolls of flagging
   l. 100 ft. of parachute cord
   m. 1 roll of fiber tape
   n. 1 weather kit
   o. 6 fusees
   p. 1 bastard file
   q. IC kit/paperwork
   r. 1 pen

2. A power chainsaw, crosscut saw, fuel, oil, necessary accoutrements, and additional water may be packaged in approved cargo containers and delivered to rappellers.

3. Potable water and other small items may also be packaged in an approved 5-gallon cubee that is harnessed (#MTDC-1087) and delivered along with the cargo and chainsaw equipment containers.
H. **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 the date of manufacture. Harness tags from the manufacturer may be used.

1. Two harness sizes are available:
   a. The small/medium size model RDT-QC/S/MBK will fit most spotters
   b. A larger size harness model RDT-QC/UBK is also available

2. **Inspection:**
   a. The spotter harness must be inspected by the user prior to use
   b. Inspect stitching and webbing for abrasion, wear or other damage
   c. Check leg strap buckles, chest strap buckles, dorsal D-ring and adjusters for correct adjustment and function
   d. Check pivot link connectors for correct function
   e. A Rappel Equipment Inspection Form shall be maintained for the life cycle of the spotter harness

**IMPORTANT NOTE:** The following equipment must have a date stamp or tag and will have a life cycle of 10 years from the date of manufacture: extendable spotter tether (NTDP-1132), HR4 Rappel Harness, Miller Revolution spotter harness, cargo letdownlines (MTDC-983), cargo restraints (NTDP-1156), cargo box harnesses and loops (NTDP-1087, NTDP-1088, NTDP-1112). The ARS Spotter Anchor, Yate’s Rappeller Tether, and Bluewater Rope will have a life cycle of 5 years from the “in-service” date.

   a. The spotter harness must be inspected by the user prior to use
   b. Inspect stitching and webbing for abrasion, wear or other damage
   c. Check leg strap buckles, chest strap buckles, dorsal D-ring and adjusters for correct adjustment and function
   d. Check pivot link connectors for correct function
   e. A Rappel Equipment Inspection Form shall be maintained for the life cycle of the spotter harness

I. **Extendable Spotter Harness Tether**

The extendable spotter harness tether is the interface between the spotter harness’s dorsal attachment point and an approved hardpoint. The extendable spotter tether for the Miller Revolution Harness RDT-QC/S/MBK and RDT-QC/UBK will be manufactured in accordance with drawing #NTDP-1132.

1. The harness tether in its non-extended configuration shall be adjusted to an overall length of 27 inches to prevent the harness dorsal attachment point from extending past the door sill of the helicopter. 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 ‘Super Tack’ cord or a ¾” bar tack as shown in Appendix F.

2. The Rock Exotica rockD Lanyard Pin Carabiner (C2S LPAA) is attached to the free end of the spotter tether connecting to an installed ARS Anchor (STC or manufacturer-approved helicopter hardpoint, tower hardpoint, or other approved tether attachment point).
3. The tether is designed to extend an additional 18 inches in length, as necessary, to assist a rappeller in distress or to clear a letdown operation. To extend the tether, the spotter will depress the two side-release buttons while putting slight pressure on the tether, making sure the buckle halves release. The additional tether webbing will deploy as tension is added to the tether. There is no need to manually deploy or unfasten the pull-the-dot snap straps when deploying the tether extension. When the extended length is no longer required, the spotter will reconnect the ISC buckle as soon as practical. The extendable section of webbing will be re-secured by refastening the pull-the-dot snap straps when the mission has ended.

4. If a spotter releases the extendable section of the tether to assist a rappeller or cargo letdown problem during tower training, a proficiency rappel, or an operational rappel, that action is considered a reportable event. The SAFERAP system will be used to report such deployments whenever they occur.

5. Each spotter harness tether shall have a tag and will have a life cycle of 10 years from the date of manufacture.

6. Inspection:
   a. The tether shall be inspected with the spotter harness prior to operation. A shared Rappel Equipment Inspection Form may be utilized to document both the harness and tether.
   b. Inspect stitching and webbing for abrasion, wear or other damage
   c. Metal hardware should be free from cracks, dings or other damage
   d. Extendable tether material must be stowed and captured by the pull-the-dot snap straps
   e. Meets lifetime criteria for use (10 years)

J. Rappel Spotter Anchor

1. The means for attaching the rappel spotter tether to the aircraft will be the Air Rescue Systems (ARS) Anchor (18”).

2. The ARS Anchor will be installed in the aircraft as outlined in Chapter 5, IV, C, of this guide in accordance with the ELAM STC installation instructions.

3. Each ARS Anchor shall have a date stamp or tag and will have a life cycle of 5 years from the date placed in-service. If the in-service date cannot be verified, then the date of manufacturing will be utilized for age-based retirement. A unique base identifier must be added to the tag, which will correspond to an ARS Anchor Rappel Equipment Inspection Form.

4. Inspection:
   a. Inspect stitching and webbing for abrasion, wear or other damage
   b. Attachment ring and oval links should be free from cracks, dings or other damage. When installed, the oval links shall be wrench tightened.
   c. Meets lifetime criteria for use (5 years from in-service date)
d. Rappel Equipment Inspection Form shall be maintained for the life cycle of the ARS anchor. At a minimum, annual pre-use inspections must be documented in a Rappel Equipment Inspection Form.

e. Spotter Anchor is a component of a daily rappel rigging check, performed by a qualified spotter.

K. Rappel Harness System

The Rock-N-Rescue HR-4 Wildland Fire Rappel Harness System is comprised of several components, each requiring special consideration. This harness is the only harness approved for wildland-fire rappel missions.

1. HR4 Rappel Harness: This harness shall be issued and tagged with a unique identifier. Harness tags from the manufacturer may be used.

   a. Harness inspection:

      i. The harness and connecting hardware must be inspected by the rappeller prior to operation
      ii. Inspect stitching and webbing for abrasion, wear or other damage
      iii. Check buckles and adjuster hardware for damage and correct function
      iv. Each harness shall have a life cycle of 10 years from the date of manufacture
      v. A Rappel Equipment Inspection Form shall be maintained for the life cycle of the rappel harness

2. The Rock Exotica rockD Lanyard Pin Carabiner (C2S LPAA) will be attached to the webbing bridge of the HR4 harness with the lanyard pin installed (FIGURE 4-1).

   a. Carabiner inspection:

      i. Check all parts for cracks, deformation, corrosion, wear, etc. Verify that the gate and sleeve close, lock and function properly in every respect. The key slot must not be impaired by dirt, corrosion, etc. Ensure that the lanyard pin is in place and secured by the locking setscrew.

      ii. Fully open the gate of the carabiner, then release. Ensure that the gate locks upon closing.

Figure 4-1
b. Replacement of carabiner:
   The carabiner shall be installed by a qualified spotter. Proper installation shall
   be independently verified by an additional rappeller/spotter prior to use, and
   the Rappel Equipment Inspection Form sheet shall be updated to reflect the
   replacement.

L. Yate’s Rappeller Tether
   The rappeller tether shall be used as a secondary restraint during the rappel sequence
   and not removed until the rappeller weights the descent system and is given the
   rappel signal. The built-in shock attenuator (“screamer”) is designed to deploy if the
   tether is subjected to a 600-pound force. Retire the tether if it is subjected to or shows
   evidence of a fall.

   IMPORTANT NOTE: Any equipment item with lifetime retirement criteria shall be
   retired once it meets that time limitation. If manufacturer’s date stamps
   become illegible, damaged or lost, the equipment shall be retired and
   documented. Any equipment with a lifetime limitation that cannot be age-
   verified shall be retired.

1. Each rappel tether shall have a date tag and unique identifier and will have a life cycle
   of 5 years from the date placed in-service. If the in-service date cannot be
   verified, then the date of manufacturing will be utilized for age-based retirement.

2. Inspection:
   a. Inspect stitching and webbing for abrasion, wear or other damage
   b. Hardware must be free from cracks, dings or other damage
   c. Check snap shackle for proper function
   d. Inspect shock attenuator (“screamer”) for wear and evidence of deployment
   e. When installed, the oval links shall be wrench tightened
   f. Meets lifetime criteria for use (5 years from in-service date)
   g. A Rappel Equipment Inspection Form shall be maintained for the life cycle of
   the rappeller tether. At a minimum, annual pre-use inspections must be
   documented in the rappeller tether Rappel Equipment Inspection Form.
   h. Rappeller tethers are a component of a daily rappel rigging check, performed
      by a qualified spotter
IV. Rappel Rope

A. Rope Standards

The only rope approved for helicopter rappel operations is the 11mm Bluewater Armortec Rope. This is an aramid, polyester and nylon kernmantle rope with a breaking strength of 8200 pounds. Each rope end will be terminated using a dual sewn termination and metal thimble. Rope lengths of 250’ and 300’ are approved for helicopter rappel operations. For easy identification, 300’ ropes will be designated with a black tracer stitch running the length of the rope. Ropes of other lengths may be utilized for tower and training purposes.

The rope length, serial number, part number, and date of manufacture are listed on both ends of the rope under the plastic termination protectors. Each rope end protector must be marked “A” or “B”. These identifiers will be used to track rope usage.

B. Procedures for Putting New Rappel Ropes into Service

1. Remove new rope from packaging and randomly flake into a pile on a clean, dry surface (not concrete or asphalt).
2. Carefully inspect the entire rope, including terminated ends and thimbles, for defects or abnormalities.
3. Mark each end with an “A” or “B”, create a new Rappel Equipment Inspection Form documenting the pre-use inspection, and enter the rope serial number into RapRec.
4. Secure the rope to a properly sized rope bag utilizing a rubber band, add a section of high visibility flagging, and flake the rope into the bag.
5. Place an Ok tag on the thimble.

C. Rope Care

1. Drying wet ropes:

If ropes become wet, the ropes should be air dried away from direct sunlight. Do not dry ropes on concrete or asphalt surfaces; chemicals in concrete and asphalt can contaminate and damage ropes. Never dry a rope in a clothes dryer. Ropes shall be inspected once dry.

2. Rope cleaning:

Ropes may be washed using a mild soap and cool water bath. Rope specific soaps are available from multiple manufactures (examples of acceptable cleaners are Edelweiss Rope Wash, Beal Rope Cleaner, Sterling Rope Wash, and PMI Rope Soap). Completely submerge the rope in soapy water and agitate to remove dirt particles. Rope brushes may be used (examples are CMI or PMI Rope Washers). Rinse well in several baths of clean water. It is extremely important to remove all soap residue, as leftover soap will attract dirt. After rinsing, loosely coil
the rope and air dry in the shade. Never use cleaners with bleach or bleach substitute. Never wash or dry a rope in a washing machine or dryer. Once dry, inspect the rope.

3. Extending service life:
   a. Avoid stepping on ropes
   b. Avoid prolonged exposure to sunlight - dry ropes in the shade
   c. Avoid exposure of ropes to rough surfaces
   d. Avoid dragging ropes on the ground
   e. After ropes have been released from helicopter, avoid dragging ropes across limbs and brush whenever possible
   f. Avoid contact with all chemicals that may contaminate rope
   g. Keep ropes away from heat sources
   h. Avoid laying ropes on concrete or asphalt

4. Storage:
   All ropes shall be stored under clean and dry conditions. After being placed in service, ropes may be stored in rope bags, provided that clean, dry storage conditions prevail.

D. Rope Use

Rope use and inspection criteria have been developed based on manufacturer recommendations along with guidelines from the Cordage Institute regarding the inspection of kernmantle ropes.

1. No rope shall be used for more than five years from the date placed in-service. If the in-service date cannot be verified, the date of manufacturing will be utilized for age-based retirement.

2. Helicopter rappel rope-use information shall be kept for each rope utilizing the RapRec system. Information entered RapRec shall include:
   a. The length, date, type and location of rappel
   b. The name of the rappeller(s) that used the rope
   c. The end of the rope that was attached to the helicopter or tower

3. No rope shall be used if it shows evidence of overheating, visible damage that would compromise its strength or safety, or contamination with foam concentrate, retardant or any petroleum product.

E. Rope Inspection

Ropes shall be inspected and documented after each use and at the beginning of each season.
1. The strength of a kernmantle rope resides in the core of the rope. Because you cannot see the core, it is important that inspections thoroughly evaluate the core by feeling the rope. The core of the rope should be uniform when felt by hand. Any abnormalities must be brought to the attention of a spotter. Additionally, if the core or inner sheath fibers can be visually seen through the aramid sheath, the rope should be removed from service. To inspect, 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, sheath creep, burrs, or anything out of the ordinary. Look for visual indications of abuse, such as cuts, core damage, or heat glazing. If damage is apparent, remove the rope from service and document it on the Rappel Equipment Inspection Form. The entire length of the rope should be inspected regardless of the length of rope rappelled.

2. Thimbles and sewn terminations shall be inspected after each use. Inspect thimbles for deformities, cracks and sharp edges. Sharp edges of thimbles may be smoothed using an emery cloth or a fine file. Make sure metal filings do not drop into the rope weave. Visibly inspect the sewn terminations through the plastic protective cover. Any rope with termination thread that appears to have been broken, cut, pulled, or damaged in any way, should be retired.

3. After the rope has been inspected and Ok’d for service, a tag will be placed through the thimble to signify the rope is ready for use (see FIGURE 4-2).

4. 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 be marked “A” and “B” respectively.

5. A Rappel Equipment Inspection Form shall be maintained for the life cycle of the rope.

F. Rope Service Life Factors

1. Dirt:

   Any contaminant that works into the fibers and construction of the rope can cause deterioration. Mud, dirt and sand can cause abrasion damage to rope fibers and descenders. Because of the potential for fiber abrasion, ropes should not be stepped on. Look for excessive mud and dirt and wash the rope as needed. Feel the rope for particles that could possibly work into the rope. Avoid dragging the rope over the ground.

2. 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 damage ropes.

3. Cross-Contamination:

Any surface that ropes or other rappel gear may contact should be inspected for the presence of contaminants. Textiles and leather can absorb and transfer contaminants to other gear. Petroleum products can reduce the friction between the rope and the descender. Pitch from coniferous trees can increase the friction between the rope and the descender, making it more difficult to descend. Fire retardant contains powerful corrosive agents that can damage ropes and metal hardware. Any source of contamination, including dirty fire shirts, chainsaw bar oil stains, dirty Nomex pants, and dirty/retardant-covered line gear, must not be allowed to contact ropes, gloves, harnesses, descenders, carabiners and any other rappel gear. Ropes and rappel gear should always be stored in a clean, dry, chemical-free, rodent-proof lockers or vehicle compartments when not in use. During operational hours ropes and rappel gear may be placed in ready-lockers, or up-load racks as long as they are out of direct sunlight. The interior seats and cabin of helicopters used for rappelling must be kept exceptionally clean.

V. Descender

A. Descender

The ISC D4 Work/Rescue Descender, shall be used for all rappel operations. This is a bobbin/cam squeeze-type descender. The descender shall only be used with 11mm Bluewater Armortec Rope. Each descender will have a unique serial number factory stamped on the cover of the descender.

1. Helicopter rappel use information shall be kept for each descender utilizing the RapRec system. Information entered into RapRec shall include:
   a. The length, date, type and location of the rappel
   b. The name of the rappeller that used the descender
B. Configuration
There is only one correct configuration for this descender. The rope attached to the anchor of the tower or helicopter will be routed around the cam in the direction of the engraved arrow and pass between the bobbin and cam as shown in Figure 4-3. The cover must be closed with the button out. The attachment carabiner must be securely captured. All rappellers will demonstrate proficiency in descender rigging prior to rappelling from towers or helicopters. Improper rigging of the descender can lead to serious injury or death.

C. Care and Inspection
1. To extend service life of equipment, be sure to:
   a. Avoid rough handling
   b. Do not drop or drag on the ground
   c. Keep clean
2. Descender inspection:
   a. Visually inspect the entire descender for damage and irregularities. Look for cracks, corrosion, sharp edges and deformation. Sharp edges caused by carabiner contact can be smoothed out using an emery cloth or a small file. If the long axis of the carabiner attachment hole exceeds 1.25”, retire the device.
   
   b. Regular D4 Model - Inspect the bobbin for the appearance of the brass wear indicator. If the brass wear indicator can be seen, retire the device.

   D4 Endurance Model – Measure the gap as outlined below
   i. Close the cover and place the handle in the locked position.
   ii. Using your thumb, apply firm pressure to the cam in a clockwise direction (when viewed from the front).
   iii. Attempt to insert a no-go gauge between the cam and bobbin.
   iv. If the no-go gauge can be inserted, retire the device
   c. Check for loose fasteners/components
   d. Verify that the cam, when in primed position, moves freely
   e. Ensure that the side plates align correctly. Pay attention to the push button to ensure it engages fully into the moving side plate when the cover is closed. You will hear an audible “click” when the frame seats correctly.
   f. Verify that the handle rotates freely and that there are three audible “clicks” during a full handle rotation. Check that the interaction of the cam and handle is fully functional. To do this:
i. Move the handle to primed position
ii. Open the moving side plate to expose the cam
iii. Apply and maintain pressure to the cam in the direction of the anchor
iv. Pull the handle through rappel position and into panic position. When steps iii and iv are performed, the function of the handle and cam should move together. When the handle reaches the panic position, the cam must snap forward in the direction of the applied pressure.

3. Cleaning and lubrication:
   a. If the device has been heavily soiled, pay close attention to the motion of the parts to ensure that dirt and foreign objects have not entered and compromised the mechanism. If there is any doubt about the function of the device, retire it. If the device becomes dirty, it is acceptable to wash and lubricate the device following these manufacturer recommendations:
      i. Using warm (< 85 degrees F) water and mild household detergent, wash the device using a soft cloth or nylon brush. Do not submerge the device completely in the detergent/water. Rinse the device thoroughly in clean water, and allow to dry naturally, turning the device several times during drying to ensure that trapped water is allowed to drain.
      ii. Apply a small amount (1-2 drops) of light oil such as 3-IN-ONE oil to the push button, moving side plate rivet head, and handle. Cycle the device a few times to distribute the oil.
      iii. Complete a descender inspection prior to returning to service and include comments regarding the cleaning in the Rappel Equipment Inspection Form.

VI. Ancillary Equipment

A. Carabiners

The only carabiners approved for life bearing use shall be the Rock Exotica rockD Carabiner (C2S AA), and Rock Exotica rockD Lanyard Carabiner (C2S LPAA).

For cargo letdown operations, the SMC Lite Stainless-Steel Locking (Bright) Carabiner will be used. Ensure that carabiners are stamped “MEETS NFPA 1983 (2001 ED)” or newer.

**IMPORTANT NOTE:** Carabiners are designed to be loaded longitudinally – if loading occurs on the side or gate, failure may occur.
1. Inspection:
   a. Check all parts for cracks, deformation, corrosion, and wear.
   b. Verify that the gate and sleeve close, lock, and function properly in every respect. The key lock slot must not be impaired by dirt or corrosion.
   c. Carabiners shall be inspected prior to each use.

2. Retire from service and destroy if the equipment:
   a. Arrests a fall or is exposed to other extreme loading
   b. Does not pass inspection or there is any doubt about its reliability
   c. Is misused, altered, damaged, or exposed to harmful chemicals

3. For programs wishing to identify their equipment, the following information is offered:
   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 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. 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-steel 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. Knife/Knife Sheaths

   All rappellers and spotters are required to have an approved knife with lanyard readily accessible for emergency use. The only approved emergency knife is the Raptor Knife (dual blade).

   1. The rappeller knife shall be enclosed within the NTDP rappeller knife sheath (#MTDC-1041) and attached to the rappel harness in the manner shown in Appendix F.

   2. The spotter knife shall be enclosed within the NTDP rappel spotter knife sheath (#MTDC-1042) and attached to the spotter harness on the left shoulder strap as shown in Appendix F.
3. Inspection:
   a. Knife sheaths are to be inspected during a harness inspection. Inspect fabric and stitching for cuts and abrasion. Inspect bar tacks and attachment loops for damage.
   b. Knives shall be inspected annually prior to field season and prior to being installed on a harness. Inspections shall be documented on the Rappel Equipment Inspection Form (harness).
   c. Ensure knives used for rappelling have properly installed blades. Knife blades shall be replaced after any use.

   **IMPORTANT NOTE:** Spotter and rappeller will independently verify the work performed and document their inspection by signing off in the Rappel Equipment Inspection Form (harness).

   d. Handle/body of knife should be free from damage; screws should be tight.
   e. Ensure the lanyard is stowed and attached as shown in Appendix F.
   f. Pull snap(s) should close/open with enough resistance to prevent inadvertent opening.

C. Cargo Restraints

   Rappel cargo within the aircraft cargo area (transmission-well positions) shall be restrained by one of the following cargo restraints:

   1. Davis Aircraft Products Part #FDC6400-569-1-080-80-10
   2. NTDP-1156 Helicopter Cargo Restraint

   Cargo restraints shall be retired 10 years from the date of manufacturing.

D. Cargo Area Barriers

   Cargo area barriers shall isolate the passengers from the cargo area (transmission wells). The contracting document provides specifications for approved cargo area barriers. Barriers shall be provided by the helicopter vendor.

E. Rappel Anchors

   The approved anchor for USFS Bell medium helicopters is the USDA Forest Service External Load Attach Mechanism (ELAM) Rappel Anchor, STC #SH261WE. The anchor shall be inspected and documented daily by the vendor in accordance with the ELAM Rotorcraft Maintenance Manual Supplement (RMMS).

   **IMPORTANT NOTE:** Contact USFS aerospace engineer at 208-387-5877, or the National Rappel Specialist at 208-387-5634 to obtain electronic versions of the installation and inspection standards for the External Load Attach Mechanism (ELAM), including the ring and stud fittings.

   The maximum equipped weight of a rappeller, including full protective clothing, boots, BD bag, rappel harness, rope and flight helmet may not exceed 300 pounds (this is an equipment limitation: rappel anchors are not certified for use with static loads exceeding 300 pounds).
1. Spotter shall visually inspect the anchor daily. The helicopter mechanic shall be notified if any of the following conditions are discovered:
   a. Loose or missing hardware
   b. Unusual wear patterns
   c. Corrosion or damage

VII. Cargo Deployment Equipment

A. Figure 8 with Ears

For wildland fire rappel and cargo letdown operations, the steel or aluminum CMC Rescue 8 with ears are the only approved letdown device. To rig the figure 8, a loop of the letdown 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 repeat the original process.

1. In order to extend the service life:
   a. Avoid rough handling
   b. Not drop or drag on the ground
   c. Keep clean

2. Inspection:
   a. Inspect for grooves developing in figure 8. When a groove develops beyond the anodized surface of the aluminum figure eight, wear will rapidly occur. If the groove is beyond 1/16” deep, retire the figure 8
   b. 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 eight from service
   c. Inspect for cracks or breaks. If cracks are evident, retire figure 8
   d. Figure 8 must be inspected by a spotter prior to each use

B. Carabiners

1. Only the SMC Lite Stainless-Steel Locking D Carabiner (bright) is authorized for cargo letdown use. See Chapter 4, VI, A, above for additional carabiner standards.

C. Cargo Letdown Lines

1. Letdown lines are available in lengths of 250 feet or 300 feet. Both letdown lines shall conform to military specification, Mil-W-5625K, for ¾” woven nylon tubular webbing. Webbing conforming to this standard has a minimum breaking strength of 2,300 pounds. Each letdown line will be identified by a unique base identifier, with all letdown uses being tracked through the RapRec system. Identifiers shall be marked on each end of the line.
2. Letdown lines of 250 feet in length will be of ¾” white tubular nylon webbing. Letdown lines of 300 feet in length will be of ¾” yellow tubular nylon webbing, and both lines will conform to drawing #MTDC-983.

3. To maintain even wear and maximize each line’s useful life, line ends will be rotated after each use. To track equipment usage, each end shall be marked “A” or “B”.

4. A 25-foot section from each end and a 10-foot section in the middle of each letdown line shall be clearly marked with black dye. Use only Rit Dye to mark lines.

5. Accordion Packs:
   a. Accordion packs will be constructed as to easily identify a 250-foot letdown line from a 300-foot letdown line.
   b. Accordion packs for 250-foot letdown lines will be constructed of white cotton duck cloth with black seam tape. Accordion pack construction will conform to #MTDC-974.
   c. Accordion packs for 300-foot letdown lines will be constructed from white cotton duck cloth with yellow seam tape. Accordion pack construction will conform to #MTDC-1037.
   d. To further identify accordion packs, 1-inch stencils will be used to mark the outside surface of accordion packs with the length of letdown line to be used.

6. Packing of letdown lines:
   Letdown lines will be packed in accordance with the “Wildland Fire Helicopter Rappel Cargo Letdown Accordion Pack” video produced by NTDP. Edge protection may be necessary along helicopter door edge or helicopter skids to reduce abrasion of the line.

7. Inspection:
   a. Letdown lines shall be inspected and documented annually prior to field season, and after every use
   b. RapRec will be used to track letdown line use history
   c. Letdown lines will be inspected for wear and burns after cargo deployment and have the ends reversed for the next letdown sequence
   d. Inspect stitching and webbing for abrasion, wear, cuts, chemical contamination or other damage
i. No letdown line shall be used for more than 10 years from date of manufacture

ii. A Rappel Equipment Inspection Form shall be maintained for the life cycle of the letdown line

D. Cargo Containers and Box Harnesses

Bags used for cargo deployment 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.

Cargo boxes shall be constructed from double-wall, 1/4”-thick cardboard with a minimum burst-strength rating of 500 pounds, and shall be certified by the manufacturer as having passed the edge crush test of 71 pounds (71-ECT). Cargo boxes must be girded with an approved box harness for deployment.

The maximum allowable weight per IA cargo letdown container shall not exceed 100 pounds. Maximum allowable weight for non-IA letdown containers shall not exceed 125 pounds. Maximum allowable weight for cubee boxes shall not exceed 50 pounds. Weight limits are imposed to assure that container-rated load limits are not exceeded and to expedite deployment from the helicopter.

Approved cargo letdown containers shall pass a static-strength test with no failure or ruptured stitches when loaded to a weight of 468.75 pounds (safety factor of 3.75 to 1).

1. The following cargo letdown containers are approved for letdown operations:

   a. Cargo box – side closure cardboard box with exterior dimensions of 12.5” x 16.25” x 36”
   b. Standard 5-gallon cubee (NFES 0048) box for delivery of potable water and other small items
   c. Metolius El Cap Haul Bag
   d. Klamath Bag
   e. NTDP Medical Bag (Brown Bag)

   Procurement sources for approved cargo letdown containers, harnesses and cargo loops are listed on the NTDP rappel website.

2. Approved cargo box and cubee box shall each require an approved harness and cargo loop for cargo letdown. Letdown equipment shall conform to the following drawing numbers and have a life cycle of 10 years from the date of manufacturing.

   a. Cargo box harness #MTDC-1088
   b. Cubee harness #MTDC-1087
   c. Cargo loop #MTDC-1112
3. **Inspection criteria for cargo boxes:**
   a. Inspect interior and exterior of the empty box for punctures, rips, cuts, severe abrasion, or failure of glued overlap sections
   b. Inspect for water damage, which may weaken the integrity of the cardboard or weaken the internal glue that attaches the corrugation to the exterior panels
   c. Inspect for chemical contamination

4. **Inspection criteria for box harnesses and cargo loops:**
   a. Prior to installing, inspect bar tacks and stitching for worn, cut or broken threads
   b. Prior to installing, inspect inner and outer sides of webbing for extensive wear, cuts, abrasion, burns, mold and chemical contamination
   c. Inspect metal closure buckles on harnesses for proper function and for cracks, bends, and sharp or rough spots that may snag or cut webbing

5. **Inspection criteria for Metolius El Cap Haul Bag, Klamath Bag, and NTDP Medical Bag:**
   a. Inspect stitching for worn, cut or broken threads that may compromise bag integrity
   b. Inspect container material for extensive wear, punctures, rips, cuts, abrasion, burns, mold or chemical contamination
   c. Inspect sling webbing for wear, cuts, severe abrasion, burns, mold and chemical contamination

6. Cargo boxes, box harnesses, cargo bags, and cargo loops shall be retired if inspection reveals damage or anomalies in accordance with the inspection criteria.
Chapter 5. Rappel and Cargo Letdown Operations

I. Aircraft Model

The Bell Helicopter 205 A1++, 210 and 212 (HP, Single) are the only models currently approved for U.S. Forest Service rappel operations.

II. Operational Responsibilities

The spotter shall be responsible for coordinating all rappel activities (pre and post-rappel). Before departure, the spotter must consider the operational factors that may influence whether the aircraft should depart from the base of operations either rappel-configured or rappel-equipped.

The spotter will provide coordination with incident management teams, local units for smaller incidents, and IA staging.

The rappel module will complete a GAR Risk Assessment for all rappel operations. The GAR Risk Assessment model creates a GO/NO-GO decision tool. The assessment may be completed at the beginning of an operational period. This completed assessment must be reviewed and updated if the team or mission changes or other mission-specific information becomes available.

Incident management teams shall allow for rappel proficiencies while rappel helicopters are assigned to their incident. The rappel spotter should work with the helibase manager to find a time and location for proficiency rappels that will have the most efficient means and have the least impact on helibase operations. The helibase manager shall inform air operations (AOBD) of the planned rappel proficiency prior to the next days’ operational shift. Inputting the action on the ICS-220 is at air operations’ discretion.
III. Pre-Rappel Briefing

Prior to any rappel mission, the spotter must brief all personnel involved as to the nature of the mission and its objectives. The information should include: environmental concerns such as weather and fire behavior (if known), individual responsibilities, incident-specific information such as location (e.g., division assignment), radio frequencies, name of communication center, and any other relevant information. Prior to any rappel operation, the pilot and spotter will identify the performance limitations for the aircraft. These limitations will ensure the performance is in the maximum-continuous range.

**IMPORTANT NOTE:** Weight and 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 outside of the aircraft in flight, it may be possible 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 the base of operations.

IV. Pre-Flight Procedures

**IMPORTANT NOTE:** The standard load of rappellers is four, seated in the aft-facing bench seat. Loads less than four are acceptable. Normal deployment of rappellers shall occur from both doors, two rappellers, simultaneously. Two-door operations and simultaneous deployment of rappellers reduces overall hover time and unloads weight from the aircraft more quickly. A single rappeller may be deployed as necessary to meet specific mission and personnel needs.

A. Configure Helicopter

1. For rappel operations, aircraft shall be set up in the following configuration:
   a. Remove the right side, two-place, forward-facing bench seat (right of center spotter seat)
   b. Ensure passenger cabin door posts are secure
c. Install approved cargo restraints in right-side transmission well
d. Ensure cargo barriers (e.g. netting) around right-side transmission well are secure.
e. Install two sets of rappeller tethers at the seatbelt rings on the aft-facing bench seat: one set on the ring between the first and third rappeller positions, and one set on the ring between the second and fourth positions (see FIGURE 5-1 and FIGURE 5-2).

![Figure 5-1](image1)
![Figure 5-2](image2)

**IMPORTANT NOTE:** The aft-facing bench seat positions are the only approved seating for rappellers when conducting rappel operations. Specific seating arrangement for each helicopter must be approved in the helicopter flight manual or STC.

**B. Cargo Loading**

**IMPORTANT NOTE:** During rappel missions, IA letdown cargo shall be carried in the right transmission well. Cargo may be deployed from either side of the aircraft as long as a W&B calculation performed by the pilot assures that the CG limits will not be exceeded at any phase during the flight.

1. Cargo shall be loaded and secured under the supervision of a qualified rappeller
   a. Load standard rappel cargo (IA fire equipment, chainsaw, cubee) in approved containers in right transmission well cargo area
   b. Restrain cargo utilizing approved cargo restraints
   c. Secure cargo behind approved cargo area barrier (e.g., netting)

**C. Spotter Tether Attachment Point**

1. Install the spotter tether attachment above the spotter seat on the upper half of the transmission housing
a. Each end of the tether shall be connected to the provided and mounted ring and stud fittings.
b. The two ring and stud fittings shall be installed by the helicopter operator on the outside edge of the transmission housing, one on each one of the two approved installation point waterlines (WL 62.2 or 68.9, see FIGURE 5-3) in accordance with the USFS ELAM STC installation instructions.

![Figure 5-3](image)

D. Rigging Rappel Anchor

1. The rappel anchor (ELAM) shall be rigged in the following manner under the supervision of a qualified spotter:

   a. Install rockD carabiners to overhead anchor hardpoints, with wide-end down, gates facing aft (see FIGURE 5-4)
   b. Install rockD carabiner at the forward slot of each door bracket, barrel down, gate facing inboard (FIGURE 5-5, b.-d)
c. Install a second rockD carabiner to each upper carabiner, barrel down, gate facing aft
d. Thread each rope through the lower carabiner at the door bracket
e. Attach each rope end thimble to the carabiner on the overhead anchor
f. Secure rope bag
g. Spotter shall then inspect all rappel rigging once installed

E. Pre-flight Briefing and Administration

1. Prior to departure, the pilot and involved personnel shall receive a briefing on mission objectives, communications, known hazards and any special mission information.
2. Load calculations and manifests complete and posted.
F. Buddy Check

**IMPORTANT NOTE:** A buddy check will be completed prior to a rappeller preparing to board the aircraft. All steps of the buddy check are to be performed visually and/or 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 noted below in bold typeface must be checked both visually and tactiley. *Italicized words in parentheses are for instructing/information purposes only.*

1. **Flight helmet**
   a. In good condition *(no cracks or damage)*
   b. Visor down or up with approved eye protection *(that meets ANSI Z87.1)*
   c. Mic boom up *(multiple mic booms exist and can be visually inspected for correct placement)*
   d. Chin strap in place *(adjusted for snug fit, with no loose ends)*
   e. Avionics cord secured (inside Nomex shirt or flight suit)

2. **Nomex Shirt**
   a. Shirt collar up, buttoned to the top and tucked in, or flight suit fully zipped
   b. Pockets secured
   c. Sleeves down

3. **Rappel gloves**
   a. **Gloves in good condition** *(free of pitch or contaminants, stitching and padding intact with no holes in palms, between fingers, flap, thumb/forefinger gusset)*

4. **Harness**
   a. **Risers**
      i. Snug fit
      ii. Webbing and visible stitching in good condition
      iii. No twists
      iv. Loose ends secured
   b. **Lat straps**
      i. Snug fit
      ii. Webbing & stitching in good condition
      iii. No twists
      iv. Loose ends secured
c. Webbing bridge
   i. Webbing and stitching in good condition
   ii. No twists

d. Carabiner and Descender
   i. **Gate is closed and locked**
   ii. **Lanyard pin in place**
   iii. **Descender attached**

5. BD bag
   a. **Click locks secured, horns out**
   b. Top straps through handle, buckles secured
   c. Side straps tight
   d. Zipper closed
   e. Double tap on BD bag to indicate rappeller to lift bag
   f. Bottom of BD bag in good condition

6. Leg straps
   a. Buckles attached, no fabric caught
   b. Snug fit
   c. Webbing and stitching in good condition
   d. No twists
   e. Loose ends secured

7. **Raptor knife**
   a. **In sheath**
   b. **Snaps secured**
   c. **Lanyard stowed**
   d. **Horn facing aft**

8. Nomex pants and boots
   a. Pockets secured
   b. Pants over boots

9. Single tap on BD bag to indicate rappeller to turn around

10. Helmet in good condition (*No cracks or damage*)

11. Hair tucked in

12. Harness
   a. Webbing and stitching in good condition
   b. No twists
   c. Loose ends secure
   d. Tag pouch secure
13. Nomex
   a. Waist belt clear
   b. Pockets secured

14. Indicate rappeller to turn around with a single tap on the left shoulder

15. Exchange thumbs-up indicating a complete buddy check

G. Boarding Sequence

1. Once the buddy check has been completed, rappellers organize into proper rappel order and prepare to board the aircraft. Rappellers load from inboard seats out.

2. Starting with rappellers boarding on the right side of aircraft then moving to the left side, the spotter performs an equipment check on each rappeller, replicating the steps for a buddy check. 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.

3. Once complete, each rappeller boards the aircraft and takes a pre-assigned seat. The first rappeller boarding on each side will perform visual and tactile checks on equipment (door bracket carabiners, rope routing, and rope attachment at ceiling bracket). Move into seat, fasten rappeller tether to inboard side of the webbing bridge with release handle facing downward (tether shall not cross rappellers body), and then attach seatbelt (under descender and tether).

4. The rappeller plugs into the ICS system if appropriate.

5. The last rappeller to be loaded performs spotter check and gives “thumbs-up” (see H, below) prior to boarding the aircraft. If all is correct, a thumbs-up signal is exchanged, then the rappeller boards the aircraft.

6. Spotter completes the preflight walk around.

7. Spotter enters aircraft, ensures aircraft doors are closed, checks carabiners, rope routing, and that the ropes are attached. Spotter taps inboard rappellers’ and points to rigging. Thumbs-up signal between spotter and inboard rappellers indicates inspections have been performed.

8. Spotter checks the rappellers’ seat belts and rappeller tethers.

9. Spotter connects tether, plugs into radio system, takes seat, fastens seat belt, displays tether showing that the carabiner is attached to spotter anchor and seat belt is secure. If all is correct, a thumbs-up signal is exchanged with all rappellers on board.

10. Outboard rappellers secure rope bags
H. Equipment Check of Spotter by Rappeller

IMPORTANT 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. *Italicized words in parentheses are for instructing/information purposes only.*

1. Flight helmet
   a. In good condition *(no cracks or damage, avionics in place, no eye protection required)*
   b. Chin strap in place

2. Nomex shirt
   a. Shirt collar up, buttoned to the top and tucked in, or flight suit fully zipped
   b. Sleeves down

3. Gloves
   a. In good condition *(Nomex flight glove, PMI GS2200, Metolius full-finger, or Metolius climbing ¾ finger with Nomex flight gloves. Gloves shall have no holes and be free of contaminants)*

4. Harness
   a. Chest and leg straps buckled
   b. Snug fit
   c. Webbing and stitching in good condition
   d. No twists
   e. Loose ends secured

5. Nomex and boots
   a. Pants over boots

6. Raptor knife
   i. In sheath
   ii. Snap secured
   iii. Lanyard stowed
   iv. Horn facing to the left

7. Signal spotter to turn around with a tap on the knife sheath

8. Helmet in good condition

9. Harness
   a. Webbing and stitching in good condition
   b. No twists
   c. Loose ends secure
   d. Spotter tether attached to dorsal D-ring and tacked
   e. Extendable tether locked, and snaps secure
   f. Carabiner in place at end of tether
10. Signal spotter to turn around with a single tap on left shoulder

11. Exchange thumbs-up, indicating a complete spotter check

I. Rope Security

Prior to flight, spotter will ensure rope bags are secured in the aircraft. Spotter will ensure outboard rappellers have rope control prior to opening aircraft doors.

J. Preparing for Flight

1. Prior to flight, spotter and pilot establish communication through intercom and ensure the following steps are accomplished:
   a. Ensure all mission-specific items have been addressed
   b. Set radio frequencies as appropriate
   c. Confirm coordinates are entered into GPS if applicable
   d. Spotter states to pilot, “OK to depart”

2. Once in flight, contact appropriate flight-following authority (ATGS, HLCO, dispatch, etc.)
V. **In-Flight Procedures**

All communications between spotter and pilot related to the deployment of rappellers and cargo will be done in the form of challenge and response. Spotter shall provide constant feedback to the pilot regarding the position and movement of the aircraft, proximity to hazards, and progress of the rappellers and cargo descent.

During deployment of rappellers and cargo, the pilot shall maintain the hover utilizing horizontal, vertical, or a combination of reference points that provide a stable rappel hover. Pilots should not attempt to maneuver the rappellers on the rope as they would with longline cargo procedures.

A. **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 prior to deploying rappellers.

1. Pilot 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.

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

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

4. Where possible, helicopter should maintain at least a 50-foot clearance above any obstacles before starting a rappel. If this is not possible and the helicopter must descend below the canopy, rotor clearance must meet the current standards in the NSHO.

5. 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.**”

6. Spotter responds, “**Power is good.**”

7. Spotter directs rappellers to unplug and stow ICS communications.

B. **Rappel Sequence**

1. Pilot states to spotter, “**One minute out, airspeed below 40 knots.**”
2. Spotter responds, “One minute out, airspeed below 40 knots, coming out of my seatbelt.”
3. Spotter activates hot mic if not already activated.
5. Pilot responds, “Master caution reset.” 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). Spotter must visually and verbally clear main and tail rotor from obstacles prior to giving directions to move the aircraft.
6. Once over the rappel site, spotter states to pilot, “Ready to drop ropes, how is the power?”
7. Pilot confirms power. If within limits, pilot responds to spotter, “Power is good, drop ropes.”
8. 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 and pilot. The rappeller and pilot must acknowledge.
10. Pilot responds, “Rappellers hooking up.”
11. Spotter then gives the Remove Seat Belt hand signal to each rappeller.
12. Rappeller removes seat belt, slides to outboard position on the bench seat, grasps rope, rigs descender with foot trap utilizing outboard foot, inspects rigged descender and presents to spotter with outboard hand on rope to the ground, and inboard hand on rappeller tether.
14. Spotter states to pilot, “Rappellers to the skids.”
15. Pilot responds, “Rappellers to the skids.”
16. Spotter gives Move to Skid hand signal to each rappeller. Rappeller moves to the skid, squares up with rope on right side of body, with left hand moves descender handle to “primed position”, visually clears rope to the ground, visually inspects descender, places right hand on rappeller tether release, returns eyes to spotter in ready position. If a rappeller identifies a knot or other problem on the rope, this must be communicated to the spotter. The spotter must acknowledge.
17. Spotter states to pilot, “Ready to send rappellers, how is the power?”
18. Pilot verifies power. If within limits, pilot responds to spotter, “Power is good, send rappellers.”

20. Rappellers release rappeller tether, begins transitioning off skid looking at the anchor. Continue transition to an inverted state.

21. Once off skid, stop, ensure rope is over the lip, and descend to ground while maintaining on-rope situational awareness.

22. Spotter keeps pilot apprised of the helicopter positioning, rappel site, and rappellers’ progress down the rope; states to pilot, “Rappellers off the skid ... half way ... on the ground.”

23. Once on the ground, rappeller manipulates cam with thumb to gain slack, opens cover, removes rope to derig descender, and moves to a safe area away from the rappel site. Rappellers must use appropriate hand signal (or radio if quickly accessible) to inform spotter if there is a bad rope or rappel site.

24. Once rappellers move to a safe area, spotter may repeat rappel process from Step 9 to deploy additional rappellers.

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

26. Spotter states to the pilot, “Right side/left side rope away, right side/left side door shut.”

27. Spotter states, “Clear to depart.”


29. The spotter, with concurrence from the pilot, may initiate the cargo deployment procedures at this time. Pilot may elect to maintain hover or circle until cargo is prepared. See Section VII, below, for cargo deployment procedures.

30. Once rappel and cargo deployment operations are complete, spotter will:
   a. Return radio to normal operational mode and establish radio contact with ground personnel
   b. Inform flight-following authority that rappel operation has been completed
   c. Secure loose items in the helicopter
   d. Fasten seat belt

31. The helicopter shall remain in the area until rappellers have positive communication with dispatch, division, etc.

C. 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 must be rigged in flight. Remaining rappellers must perform a visual check after the spotter completes the rigging process. Once complete, a thumbs-up is exchanged and the rappel sequence will resume at Section V, A, 1, above.
VI. Post-Rappel

A. Administrative/Debrief

1. Complete necessary documentation pertinent to the mission.

2. Spotter/pilot will critique the mission and/or discuss problems that may have occurred.

3. Upon return of rappellers, spotter and rappellers will critique the mission.

VII. Cargo Deployment Procedures

A. Cargo Deployment Procedures

The deployment of cargo generally occurs as part of the rappel operation following the deployment of rapplers. When cargo is deployed as part of the rappel mission, Sections B and C below are incorporated in the pre-flight procedures with Section IV, J, above. Sections D and E below provide particular detail not directly addressed in the rappel procedures and should be reviewed and followed.

Cargo may also be deployed independently of the rappel mission for the purpose of resupplying firefighters or supporting other operational missions. The following procedures encapsulate the cargo delivery operation.

B. Pre-Flight Procedures for Cargo Deployment Missions

1. Prior to departure, the pilot 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. 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 his/her tether to the spotter anchor.

C. Rigging and Loading Cargo

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

2. Spotter rigs cargo with carabiners and secures in helicopter in accordance with Section IV, B, of this chapter.

3. Spotter checks 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 in accordance with the ELAM STC (Chapter 4, VI, E).

5. Spotter boards aircraft, connects tether, fastens seat belt, and plugs into avionics.


D. Pre-Cargo Delivery Sequence

1. Pilot 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 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 a 50-foot clearance above any obstacles before starting a cargo operation. If this is not possible and the helicopter must descend below the canopy, rotor clearance must meet the current standards in the NSHO.

6. 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.”

7. Spotter responds, “Power is good.”

8. Spotter activates hot mic if not already activated.

9. If not previously performed, spotter removes restraining straps from cargo, ensures remaining cargo is secure, and positions cargo in doorway.

10. Spotter rigs figure eight with cargo letdown line and attaches figure eight using one carabiner in the aft slot of the anchor bracket, barrel down, gate facing inboard. Spotter attaches end of letdown line to cargo with SMC Lite Stainless-Steel Locking Carabiner and locks carabiner. Spotter relays to pilot when rigging is complete.

11. Cargo letdown pack must be connected to a hardpoint in the aircraft.

12. Pilot reduces forward airspeed on approach to cargo site. The pilot states to spotter, “One minute out, airspeed below 40 knots.”


E. Cargo Deployment Sequence

Spotter/pilot communicate adequate rotor clearance, power assessments, and cargo delivery spot status throughout the operation using pilot’s perspective (left, right, forward, back, and up or down relative to altitude above the ground). Spotter must visually and verbally clear main and tail rotor from obstacles prior to giving directions to move the aircraft.

1. Once established over the cargo delivery spot, spotter states to pilot, “Ready to send cargo, how is the power?”

2. Pilot confirms power. If within limits, pilot responds to spotter, “Power is good, send cargo.”

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

4. Spotter begins lowering cargo with positive control of letdown line; does not allow un-arrested descent of cargo. Spotter keeps pilot informed of actions and progress of cargo descent, “Cargo is out the door … halfway down … cargo is on the ground.”

5. When cargo is on the ground, spotter unhooks figure 8 from carabiner and removes letdown line. Spotter holds slack in line to prevent billowing and unhooks letdown line bag from hardpoint. Spotter wraps excess letdown line around bag and throws it clear of aircraft.

6. Spotter informs 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.

7. When cargo deployment is complete, spotter states to pilot, “Derigging line, line is away, door shut, clear to depart.” Door may remain open for mission needs, however the spotter will close the door prior to leaving area of operation and/or before airspeed above 40 knots, then returns to seat and fastens seat belt.

8. Pilot responds, “Clear to depart?”


10. Radio returned to normal operational mode and flight-following authority is informed that cargo operation has been completed.
VIII. Hand Signals

The following standard hand signals shall be used:

A. Thumbs-Up

Used by rappellers and spotters to indicate "I agree" or "I am OK" (FIGURE 5-6).

![Figure 5-6](image)

B. Remove Seat Belt

Imitate removing lap belt – spotter gives signal to each rappeller (FIGURE 5-7).

![Figure 5-7](image)
C. **Move to Skid**

Hands clasped at chest level with elbows out - signal given by spotter to rappellers to direct movement to pre-rappel position (FIGURE 5-8).

![Figure 5-8](image)

D. **Begin Descent**

Arms extended with open palms down, sweeping downward motion – signal given by spotter to rappellers directing rappellers to begin descent (FIGURE 5-9).

![Figure 5-9](image)

E. **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 handle and further descent is not possible (FIGURE 5-10).

![Figure 5-10](image)
F. Begin ETO

Horizontal arm wave with outstretched arm – signal given by spotter to rappeller after rappeller has given spread eagle signal – signal indicates that rappeller should tie-off and cut rope below him/her and prepare to be lifted out (FIGURE 5-11).

G. Lift-Out

Upward motion with outstretched arms – signal given by rappeller to spotter to indicate that rope below rappeller has been cut and rappeller is ready to be lifted up. Signal is given until rappeller and rope are raised above all surrounding obstacles (FIGURE 5-12).

H. Clear to Fly Away

Both arms extended in 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. Rappeller then protects half hitches once in forward flight (FIGURE 5-13).
I. 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 (FIGURE 5-14).

Figure 5-14

J. Discontinue Rappel

Slashing motion across throat with one arm – signal given by rappeller to spotter indicating bad rappel site, discontinue rappel (FIGURE 5-15).

Figure 5-15

K. 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 (FIGURE 5-16).

Figure 5-16
L. **Return to Seat Belt**

With arms extended and fists clenched, bring fists and elbows together—signal given by spotter to indicate rappeller(s) should return to seat and buckle seat belt (FIGURE 5-17).

![Figure 5-17](image)

M. **Communication Lost**

Single clenched fist—spotter will signal to the pilot the loss of communication with a shoulder tap and presentation of a single clenched fist. When ready to depart, spotter will signal to pilot with a shoulder tap and thumbs-up (FIGURE 5-18).

![Figure 5-18](image)
Chapter 6.  Rappel and Cargo Operations Emergency Procedures

I.  Rappeller Emergency Procedures and Signals

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

A.  Rappeller Emergency Tie-Off (ETO) Procedure

1.  If during a rappel, the rappeller encounters a problem that will hinder his/her progress to the ground, the rappeller will attempt to clear the problem. The rappeller may execute a midline stop to correct the problem. If a rappeller still cannot resolve the problem, the rappeller will lock the handle, return attention to the spotter and give the Spread-Eagle signal. If the spotter gives the Begin ETO signal (horizontal arm wave), the rappeller will initiate an emergency tie-off (ETO) and cut the rope below them. If no ETO signal is given, the rappeller will be lowered to the ground (see Chapter 5 for hand signal descriptions).

2.  ETO is a procedure completed to permanently secure the rappeller’s position on the rope. Some situations when a tie-off may be required are:

a.  The rope becomes entangled, preventing the rappeller from descending or creating a hazard to the helicopter.

b.  A knot on the rope has become lodged in the descent device.

c.  The rappeller has a descender malfunction.

3.  When a problem occurs and the helicopter has insufficient clearance from obstacles to lower rappeller to ground or there is a problem with the rappel site/landing area, the spotter will signal the rappeller to begin the ETO procedure.

4.  The ETO procedure is as follows:

a.  Bring running end of rappel rope through the harness between the webbing and rappeller’s body from right to left where the descender is attached. Pull up 3-4 feet of slack to form a running loop.

b.  Bring loop up and over descender 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.

c.  Form another half hitch on top of the first one. Pull tight. A 6 to 18-inch looped tail should remain.

d.  Move rope to left side of body, remove knife, cut the running end of rope approximately 3-4 feet below the descender.
e. After the rope has been cut, the rappeller stows knife and 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 Fly Away signal. The rappeller will protect half hitches during flight. Then, the helicopter transports the rappeller to the emergency site. Upon arriving at a safe landing site, the rappeller is lowered to the ground.

f. Once on the ground, the rappeller shall untie half hitches, derig descender and clear the area. If this isn’t possible the rappeller will wait for slack in the rope, preventing possible snap back towards the helicopter rotors. Then the rappeller removes the Raptor knife and cuts the rappel rope above the half hitches and clears the area.

B. Rappeller in Distress

1. 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 a problem to the spotter.

   a. If a rope defect or problem is evident, the rappeller will give the Bad Rope signal (See Chapter 5, Section VIII, I), indicating to the spotter the rope is unsafe and the mission should be completed with a new rope.

   b. If a rappeller on the ground recognizes the rappel site is a safety problem, the rappeller will give the Discontinue Rappel signal (See Chapter 5, Section VIII, J), indicating to the spotter that site is unacceptable, and another location should be selected.
II. In-Flight Emergencies

IMPORTANT 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 appropriate time and place to discover that, “what you heard is not what I meant.” This should be accomplished through briefings and on-the-ground emergency exercises.

A. Emergency Communications and Categories

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

1. During rappel operations, there are two basic categories of in-flight emergencies:
   a. Those that require an **immediate** response (land as soon as possible)
   b. Those that permit a **delayed** response (land as soon as practicable)

B. Immediate Response Emergencies (Land as Soon as Possible)

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.

1. Examples of possible emergencies:
   a. Engine failure
   b. Tail rotor failure
   c. Hard-over of controls
   d. Engine over speed/driveshaft failure
   e. Compressor stall (single engine)
   f. Governor failure low side (twin engine)
   g. Governor failure (single engine)

C. Delayed Response Emergencies (Land as Soon as Practicable)

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 or cargo deployment prior to departing the hover.
1. Examples of possible problems:
   a. Transmission/engine/tail rotor gear box chip light
   b. Hydraulic failure
   c. Oil temperature/oil pressure light
   d. Hydraulic temperature or pressure light
   e. Unknown master caution
   f. Fire light (requires pilot check of controls and for fire on board)
   g. Stuck pedal
   h. Fuel control or governor failure high side (twin engine)
   i. Electrical failure
   j. Fuel/air filter clog
   k. Fuel pump failure
   l. Decrease in rotor RPM
   m. Compressor stall (twin engine)
   n. Severe up or down drafts

**IMPORTANT NOTE:** The example of possible problems listed above note delayed responses and may not require immediate action other than communication and monitoring; response actions can vary in time from seconds to minutes.

III. Pilot and Spotter Actions – Rappel Operations

A. Rappel Immediate Response Actions

1. See Table 6-1 on the next page for pilot and spotter actions during an in-flight emergency requiring an immediate response.

**IMPORTANT NOTE:** The “Abort, Abort” and the subsequent actions taken by the pilot and spotter will occur almost simultaneously. The pilot will attempt to gain forward flight, if possible, which will require that the spotter clears 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 on board, as well as increase the risk to rappellers on the ropes.
### Rappel - Immediate Response (Land As Soon As Possible)

#### PILOT DUTIES

It is imperative that the pilot diagnose this emergency accurately and without delay. Additionally, the pilot must simultaneously alert the spotter by stating “**ABORT, ABORT.**”

#### SPOTTER DUTIES

The spotter’s response must be immediate; however, actions will vary depending on the phase of the rappel when the emergency occurs. It is critical that spotters understand the sequence. Unnecessary delay may result in a catastrophic outcome for the aircraft and crew.

<table>
<thead>
<tr>
<th>PHASE OF RAPPEL</th>
<th>PILOT STATES</th>
<th>SPOTTER ACTION/RESPONSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAPPELLERS  SECURE, ROPE SECURE</td>
<td>“ABORT, ABORT”</td>
<td><strong>SPOTTER:</strong> State <strong>CLEAR</strong>&lt;br&gt;Immediately take seat and fasten seat belt&lt;br&gt;Doors and other cabin duties should not take priority over getting to a seat and into a seat belt&lt;br&gt;<strong>RAPPELLERS:</strong> Secure rope bags due to cabin doors remaining open throughout descent and landing</td>
</tr>
<tr>
<td>RAPPELLERS  SECURE, ROPE DEPLOYED</td>
<td>“ABORT, ABORT”</td>
<td><strong>SPOTTER:</strong> <strong>CUT ROPEs,</strong> state <strong>CLEAR</strong>&lt;br&gt;Immediately take seat and fasten seat belt&lt;br&gt;Doors and other cabin duties should not take priority over getting to a seat and into a seat belt</td>
</tr>
<tr>
<td>RAPPELLERS OUT OF SEAT BELTS, ROPE DEPLOYED</td>
<td>“ABORT, ABORT”</td>
<td><strong>SPOTTER:</strong> Give rappellers <strong>RETURN TO SEAT BELT SIGNAL,</strong> <strong>CUT ROPEs</strong> below descender, state <strong>CLEAR</strong>&lt;br&gt;Immediately take seat and fasten seat belt</td>
</tr>
<tr>
<td>RAPPELLERS ON SKIDS</td>
<td>“ABORT, ABORT”</td>
<td><strong>SPOTTER:</strong> Give rappellers <strong>RETURN TO SEAT BELT SIGNAL,</strong> <strong>CUT ROPEs</strong> below descender, state <strong>CLEAR</strong>&lt;br&gt;Immediately take seat and fasten seat belt</td>
</tr>
<tr>
<td>RAPPELLERS IN DESCENT (OFF SKIDS)</td>
<td>“ABORT, ABORT”</td>
<td><strong>SPOTTER:</strong> <strong>CONFIRMS THE EMERGENCY</strong>&lt;br&gt;(Either by the obvious flight profile of the aircraft or by challenge and response with the pilot)&lt;br&gt;<strong>CUT ROPEs,</strong> state <strong>CLEAR</strong>&lt;br&gt;Immediately take seat and fasten seat belt</td>
</tr>
<tr>
<td>RAPPEL COMPLETE, DERIGGING AIRCRAFT</td>
<td>“ABORT, ABORT”</td>
<td><strong>SPOTTER:</strong> <strong>CUT ROPEs,</strong> state <strong>CLEAR</strong>&lt;br&gt;Immediately take seat and fasten seat belt&lt;br&gt;Doors and other cabin duties should not take priority over getting to a seat and into a seat belt</td>
</tr>
</tbody>
</table>

*Table 6-1*
B. Rappel Delayed Response Actions

1. See TABLE 6-2 on the next page for pilot and spotter actions during an in-flight emergency or situation that may be addressed through a delayed response.

**IMPORTANT NOTE:** 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. If at any point continued flight is hazardous due to environmental conditions, the pilot will state “Expedite, Expedite.”
### Rappel - Delayed Response (Land as Soon as Practicable)

**PILOT DUTIES**

When experiencing a delayed response emergency, “**EXPEDITE, EXPEDITE**” is intended as the initial alert for the crew - communicating that the rappel must be halted due to an aircraft malfunction or environmental condition. It should not be the only communication passed. As the situation allows, the pilot should advise the crew of the aircraft status and the intended duration of the flight. It must be understood if rappellers have left the skids, the aircraft will remain stable until the rappel is complete and ropes have been cut.

**SPOTTER DUTIES**

Unnecessary delays should be avoided due to the critical nature of the flight profile. The only time there should be an excessive delay is when rappellers are in the descent; the spotter should advise the pilot as to the amount of time needed to get the rappellers on the ground and cut ropes.

<table>
<thead>
<tr>
<th>PHASE OF RAPPEL</th>
<th>PILOT STATES</th>
<th>SPOTTER ACTION/RESPONSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAPPELLERS SECURE,ropes secure</td>
<td>“EXPEDITE, EXPEDITE”</td>
<td>Close aircraft doors, take seat and fasten seat belt, state ”CLEAR”</td>
</tr>
<tr>
<td>RAPPELLERS SECURE,ropes deployed</td>
<td>“EXPEDITE, EXPEDITE”</td>
<td><strong>CUT ROPES</strong> Visually verify ropes are clear of skids, close aircraft doors, take seat and fasten seat belt, state ”CLEAR”</td>
</tr>
<tr>
<td>RAPPELLERS OUT OF SEAT BELTS,ropes deployed</td>
<td>“EXPEDITE, EXPEDITE”</td>
<td>Give rappellers <strong>RETURN TO SEAT BELT SIGNAL</strong> Once rappellers are in seat belts, <strong>CUT ROPES</strong> below descenders, visually verify ropes are clear of skids, close aircraft doors, take seat and fasten seat belt, state ”CLEAR”</td>
</tr>
<tr>
<td>RAPPELLERS ON SKIDS</td>
<td>“EXPEDITE, EXPEDITE”</td>
<td>Give rappellers <strong>RETURN TO SEAT BELT SIGNAL</strong> Once rappellers are in seat belts, <strong>CUT ROPES</strong> below descenders, visually verify ropes are clear of skids, close aircraft doors, take seat and fasten seat belt, state ”CLEAR”</td>
</tr>
<tr>
<td>RAPPELLERS IN DESCENT (OFF SKIDS)</td>
<td>“EXPEDITE, EXPEDITE”</td>
<td><strong>CONFIRM EMERGENCY/PROBLEM</strong> Discuss the progress of the rappel with the pilot, once rappellers are on the ground, <strong>CUT ROPES</strong>, visually verify ropes are clear of skids, close aircraft doors take seat and fasten seat belt, state ”CLEAR”</td>
</tr>
<tr>
<td>RAPPEL COMPLETE, DERIGGING AIRCRAFT</td>
<td>“EXPEDITE, EXPEDITE”</td>
<td><strong>CUT ROPES</strong>, visually verify ropes are clear of skids, close aircraft <strong>DOORS</strong>, take seat and fasten seat belt, state ”CLEAR”</td>
</tr>
</tbody>
</table>

*Table 6-2*
IV. Pilot and Spotter Actions – Cargo Deployment Operations

A. Cargo Deployment Immediate Response Actions

1. See TABLE 6-3 below for pilot and spotter actions during an in-flight emergency requiring an immediate response.

<table>
<thead>
<tr>
<th>PHASE OF CARGO LETDOWN</th>
<th>PILOT STATES</th>
<th>SPOTTER ACTION/RESPONSE</th>
</tr>
</thead>
</table>
| CARGO SECURE           | “ABORT, ABORT” | State **“CLEAR”**
|                        |              | Immediately take seat and fasten seat belt. Doors and other cabin duties should not take priority over getting to a seat and into a seat belt. |
| CARGO UNSECURE DOORS CLOSED | “ABORT, ABORT” | State **“CLEAR”**
|                        |              | Immediately take seat and fasten seat belt. Securing cargo and other cabin duties should not take priority over getting to a seat and into a seat belt. |
| CARGO UNSECURED INSIDE AIRCRAFT DOORS OPEN | “ABORT, ABORT” | CUT LINE, JETTISON CARGO OUT OPEN DOOR. state **“CLEAR”**
|                        |              | Immediately take seat and fasten seat belt. Doors and other cabin duties should not take priority over getting to a seat and into a seat belt. |
| CARGO OUTSIDE AIRCRAFT | “ABORT, ABORT” | CUT LINE, state **“CLEAR”**
|                        |              | Immediately take seat and fasten seat belt. |

Table 6-3
B. Cargo Deployment Delayed Response Actions

1. See TABLE 6-4 below for pilot and spotter actions during an in-flight emergency or situation that may be addressed through a delayed response.

<table>
<thead>
<tr>
<th>PHASE OF CARGO LETDOWN</th>
<th>PILOT STATES</th>
<th>SPOTTER ACTION/RESPONSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>CARGO SECURE</td>
<td>“EXPEDITE, EXPEDITE”</td>
<td>Close aircraft door, take seat and fasten seat belt, state “CLEAR”</td>
</tr>
<tr>
<td>CARGO UNSECURE INSIDE AIRCRAFT</td>
<td>“EXPEDITE, EXPEDITE”</td>
<td>Close aircraft door, secure cargo, take seat and fasten seatbelt, state “CLEAR”</td>
</tr>
<tr>
<td>CARGO UNSECURE OUTSIDE AIRCRAFT</td>
<td>“EXPEDITE, EXPEDITE”</td>
<td>Complete cargo deployment, “CUT LINE”, close door, take seat and fasten seatbelt, state “CLEAR”</td>
</tr>
</tbody>
</table>

*Table 6-4*
Chapter 7. Documentation

I. Records and Reports - General

IMPORTANT NOTE: The rappel report will be entered into RapRec by the base that administers the contract for the aircraft used for the rappel or cargo letdown.

Record keeping is mandatory for administering rappel operations. Accurate records and reports on rappel activities, equipment use, training and injury statistics shall be maintained. All rappel reports will be entered into RapRec within 14 days of the rappel activities. In order to reduce duplication errors, rappel reports will be entered into RapRec by the base that administers the contract for the aircraft used for rappel or cargo letdown, regardless of the equipment or personnel involved. For this reason, it is important for each base to keep its RapRec equipment and personnel rosters up to date. During consolidated training, rappel reports will be entered into RapRec by the documentation unit.

All Rappel Equipment Inspection Forms are official documents and will be kept on the forms contained in Appendix C or electronic equivalent. Rappel Equipment Inspection Forms will be archived for a minimum of seven years.

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 a retirement date on the Rappel Equipment Inspection Form when removed from service. Additionally, the retired status must be updated in RapRec.

A. Unit Records

Each unit shall maintain records documenting training for rappellers and spotters and records documenting the use and inspection of specified equipment. The forms for documenting training, the certification of personnel and tracking the equipment are found in Appendix C - Forms. See Sections II and III below for specific information and requirements for each record.

IMPORTANT NOTE: All-electronic records should be backed up to an external drive or server. A hard copy of electronic records will be printed at least once annually.

B. Rappel Injury Reporting

All rappel related injuries (rappel sequence) shall be reported through established local protocols, local helicopter operations specialist, and entered into the SafeRap system.
C. Rappel Program Proposal Form

Users are encouraged to recommend changes to this guide through their respective rappel base manager via written proposal (see Appendix C - Forms). The rappel base manager submits the proposal to the rappel operations or rappel training subcommittee chairperson for group review, concurrence, recommendation, and where applicable, forwarding to the NRWT.

II. Training, Certification, and Proficiency Records

A. Rappel Unit Log

All rappels, spots, and related information must be entered into the Rappel/Spotter Log and RapRec, and shall be readily available for review. The spotter or rappel base manager will ensure information is entered in a timely manner and that RapRec is kept current.

B. Rappeller Training Records

The Rappeller Training Record for initial training and recertification of rappellers 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 (see Appendix C - Forms, C-6 and C-7). Each rappeller will maintain a record of training, proficiency and operational rappels in the Rappel/Spotter Log and RapRec.

C. Spotter Training Records

The Helicopter Spotter Training Record for returning spotters and Qualification Record for initial training 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 (see Appendix C – Forms, C-8 and C-9). Each spotter will maintain a record of training, proficiency and operational spots of rappellers and cargo in the Rappel/Spotter Log and RapRec.

III. Equipment Master Records

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 Rappel Equipment Inspection Form assigned (see Appendix C - Forms).

A. Cargo Letdown Line

All cargo letdown line use shall be documented. After inspection, any irregularities will be noted. Use the Rappel Equipment Inspection Form (C1) to document inspection and RapRec to document use.
B. Harness

Harness and knife will be inspected annually, and harness will be inspected after each use. Inspections shall be documented in the Rappel Equipment Inspection Form. Pre-use inspection and buddy checks do not need to be documented. Any deficiencies during inspections, repairs and/or component replacement will be noted. The Rappel Equipment Inspection Form (C1) or electronic equivalent must be used for harness documentation.

C. Descender

Use and inspection of any descender shall be documented on a Rappel Equipment Inspection Form. Numbers shall be engraved according to Chapter 4, Rappel and Cargo Letdown Equipment. After each rappel, the descender shall be inspected for wear or deformity and remarks noted. After Inspection, any irregularities will be noted and brought to the attention of a spotter. When a descender is retired, it shall be destroyed to eliminate further use. Use the Rappel Equipment Inspection Form (C1) to document inspection and RapRec to document use.

D. Rappel Rope

Documentation must be maintained for all rappel ropes. A Rappel Equipment Inspection Form shall be maintained from the time the rope is placed in service until the rope is removed from service. The form 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 4, Rappel Equipment).

All rope uses shall be documented. After inspection, any irregularities will be noted and brought to the attention of a spotter. Documented information will dictate when to retire a rope from service. Use the Rappel Equipment Inspection Form (C1) to document inspection and RapRec to document use.

E. Rappeller Tether

Documentation must be maintained for all rappeller tethers. A Rappel Equipment Inspection Form shall be maintained from the time the rappeller tether is placed in service until the tether is removed from service. At a minimum, annual pre-use inspections must be documented in the Rappel Equipment Form. Inspection should follow guidelines in Chapter 4, III, L, 2. Use the Rappel Equipment Inspection Form (C1).

F. Rappel Tower

Inspection of rappel tower shall be documented annually and daily before each use. The form is located in Appendix C - Forms (Form C-11).
Appendix A
Appendix B
Appendix C
Appendix D
Appendix E
Appendix F
Appendix G
Appendix H
Appendix I
Appendix J
Appendix K
Appendix L
Appendix M
Appendix N
Appendix A
Rappel Training Syllabus
5.18.2021
USDA FOREST SERVICE
Appendix A – Rappeller Training Syllabus (V6) 6.6.19

Introduction

I. Responsibilities

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

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

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

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

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

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

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

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

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

II. Lesson Plan

A. Chapter Summary

Lesson 1 - Equipment Orientation, Inspection, Care, Issue, Fit and Suspension (Home Unit)
Lesson 2 - Program Overview and Equipment Review
Lesson 3 - Buddy Checks
Lesson 4 - Ground Training
Lesson 5 - Spotter Checks
Lesson 6 - Ground Simulator
Lesson 7 - Elevated Simulator
Lesson 8 - Emergency Procedures
Lesson 9 - Helicopter Mock-Ups
Lesson 10 - Helicopter Rappels

B. Daily Operations Schedule

<table>
<thead>
<tr>
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<th>Day 3</th>
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<th>Day 5</th>
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<td>Elevated Simulator</td>
<td>Mock-Ups</td>
<td>Live Rappels</td>
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Lesson 1 - Equipment Orientation, Inspection, Care, Issue, Fit and Suspension

I. Objectives

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

II. Training Aids

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

III. Responsibilities

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

IV. Rappel Equipment Introduction

All equipment will be monitored and life expectancy requirements will be followed in order to maintain an adequate margin of safety
Equipment approval process is identified in Appendix D of the NROG
Any questions or concerns as to the condition or safety of equipment shall be directed to a spotter
A. Equipment Orientation

Introduce each equipment item, explaining its purpose where necessary

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

V. Suspension  

A. Responsibilities  

1. Equipment  
   a. Set up ropes at each station  
   b. Have platforms available at each station  

2. Lead Instructor  
   a. Brief on intent of station; inform rappellers on how the station will be conducted  
   b. All PPE is required  
   c. Follow outline below  
   d. Demo the suspension process  
   e. Do not cover any procedures or hand signals  

3. Spotters  
   a. Use carabiner to attach to a suspended rope not using a rigged descender.  
   b. Inform rappeller if and where adjustments are needed to the rappel harness  
   c. Tack harness if needed  

VI. Field Practical  

A. Order of procedures  

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

I. Objectives
   ● Introduce cadre
   ● Cover mission statement and history
   ● Introduce performance-based training

II. Training Aids
   NROG and PowerPoint presentation and equipment listed below in “Equipment Review”

III. Course Delivery
   A. Introduction
      All available spotters, squad leaders, and specific rappel class complete introductions, JHAs, safety message, general housekeeping rules, squad assignments, and the week’s objectives.
   B. Background and History
      Utilize PowerPoint
   C. Change Blindness
      The term “change blindness” refers to the difficulty observers have in noticing large changes to visual scenes. Once the mind is conditioned to seeing something one way, changes can be hard to detect, especially when the change is unexpected. The training focuses on the correct manner of rigging the descender and the way the rappel equipment should look for rappel operations.

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

      A check spotter shall have the responsibility of instructing or directly overseeing this portion of the training. Two spotters will be knowledgeable of the misrigging of rappel equipment. Spotters who have misrigged equipment will monitor situation for when the error should have been identified. If an error is identified, the error will be corrected at that point and rechecked by both the spotter and rappeller. If a spotter starts a simulator cycle with misrigged equipment, he/she will finish the cycle before changing spotters. No change blindness training will be conducted without check spotter approval.
1. At the discretion of the check spotter, a spotter on the ground will start introducing errors in a rappeller’s equipment, to be caught during buddy checks. The rappeller whose equipment has been misrigged must have knowledge of the misrigging.

2. Any alterations to the harness connecting hardware must follow the inspection guidelines found in the NROG, Chapter 4.

3. At the discretion of the check spotter, spotter(s) will introduce errors in the rigging and equipment for the rappellers to detect during the equipment checks. Errors may be introduced in any of the rigging.

4. For spotter safety, no intentional misrigging of spotter equipment or attachment hardware will be used on the elevated simulator.

5. When appropriate, and at the discretion of the check spotter, spotters will commence incorrect hand signals.

6. No change blindness will occur during the final mock-up or live rappels.

D. Performance-Based Training

1. **Initial Rappeller Training**: Rappellers must demonstrate competency before moving on to the next lesson as determined by the check spotter. The criteria for each lesson is listed in this training aid. Failure to pass any lesson will lead to removal from the training.

2. **Classroom Training (Equipment Review/Buddy Check/Spotter Check)**: Pass/Fail – to be determined by the evaluating spotter. The rappeller must meet the objectives in this rappel training syllabus prior to moving on to ground training.

3. **Ground Training**: Pass/Fail – to be determined by the evaluating spotter. The rappeller must meet the objectives in this rappel training syllabus prior to moving on to ground simulator training.

4. **Ground Simulator, Elevated Simulator, and Mock-Ups**: A system of penalties (see errors) is incorporated into rappel training starting at ground simulator training. During ground simulator training, penalties will not be assessed until stage two. During the elevated simulator training, penalties will not be applied until the rappeller has completed one elevated rappel. Evaluating spotters will determine what action is required. Three minor penalties constitute one major penalty. After three majors, the rappeller’s immediate removal from training will be issued by the check spotter, and the rappeller’s supervisor will be informed.

5. **Helicopter Rappels**: During live rappels, one major or three minors (regardless of previous penalties) will be grounds for a rappeller’s immediate removal from training. Evaluating spotters will not allow the rappeller to continue. The rappeller’s removal will be approved by the check spotter and the rappeller’s supervisor will be informed. Continual errors accrued in prior phases of training (#4 above) are carried over into the live rappels.
E. Error Definitions

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

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

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

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

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

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

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

6. Consistency:
   Each class will assess penalties consistent with the first rappel training class of that session.
F. Errors That Invoke Penalties

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

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

1. Review each equipment item, stating its purpose where necessary
   a. Helmet
   b. Eye protection
   c. Fire-resistant clothing
   d. Rappel gloves
   e. BD bag
   f. Rock Exotica RockD Carabiner (life-bearing only)
   g. Rock Exotica RockD Lanyard Pin Carabiner (life-bearing only)
   h. SMC Lite Stainless-Steel Locking (Bright) Carabiner (cargo only)
   i. Rappel harness
   j. Spotter harness
   k. Knife
   l. Descender
   m. 250 foot rope
   n. 300 foot rope with tracer
   o. Rappeller tether
   p. Spotter anchor
   q. Rescue Figure 8
Lesson 3 - Buddy Checks

I. Objectives

● Demonstrate proper buddy check without error

II. Training Aids

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

III. Responsibilities

A. Demonstrators

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

B. Lead Instructor

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

C. Check Spotter

Determine when to introduce misrigging of rappeller

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

IV. Field Practical

Instructor will now start individual rappeller instruction on procedures
Instructor reads buddy check verbiage as rappeller performs checks.
Each rappeller performs one with verbiage being read aloud.
Rappellers shall follow the buddy check sequence as demonstrated
A. Buddy Check Demonstration

Veteran rappellers will demonstrate the correct buddy check steps
Note: Items noted below in bold must be checked both visually and tactiley
Buddy check with instructor notes (italicized words in parentheses are for instructing purposes only and not verbalized as part of the check)

1. Flight helmet
   a. In good condition (no cracks or damage)
   b. Visor down or up with eye protection *(that meets ANSI Z87.1)*
   c. Mic boom up (multiple mic booms exist and can be visually inspected for correct placement)
   d. Chin strap in place (adjusted for snug fit, no loose ends)
   e. Avionics cord secured (inside collar of Nomex shirt or flight suit)

2. Nomex top
   a. Shirt collar up, buttoned to the top and tucked in, or flight suit fully zipped
   b. Pockets secured
   c. Sleeves down

3. Rappel gloves
   a. **Gloves in good condition** (free of pitch or contaminants, stitching and padding intact with no holes in palms, between fingers, flap, or thumb/forefinger gusset)

4. Harness
   a. Risers
      i. Snug fit
      ii. Webbing and stitching in good condition
      iii. No twists
      iv. Loose ends secured
   b. Lat straps
      i. Snug fit
      ii. Webbing and stitching in good condition
      iii. No twists
      iv. Loose ends secure
   c. Webbing bridge
      i. Webbing and stitching in good condition
      ii. No twists
   d. Carabiner and descender
      i. **Gate closed and locked**
      ii. Lanyard pin in place
      iii. Descender attached
5. BD bag
   a. **Click locks secured, horns out**
   b. Top straps through handle, buckles secured
   c. Side straps tight
   d. Zipper closed
   e. Double tap on BD bag to indicate rappeller to lift bag
   f. Bottom of BD bag in good condition

6. Leg straps
   a. Buckles attached, no fabric caught
   b. Snug fit
   c. Webbing and stitching in good condition
   d. No twists
   e. Loose ends secured

7. Raptor knife
   a. **In sheath**
   b. **Snaps secured**
   c. **Lanyard stowed**
   d. **Horn facing aft**

8. Nomex pants
   a. Pockets secured
   b. Pants over boots

9. Single tap on BD bag to signal rappeller to turn around
10. Helmet in good condition (*No cracks or damage*)
11. Hair tucked in
12. Harness
   a. Webbing and stitching in good condition
   b. No twists
   c. Loose ends secure
   d. Tag pouch secure

13. Nomex
   a. Waist belt clear
   b. Pockets secured

14. Indicate rappeller to turn around with a single tap on the left shoulder
15. Exchange thumbs-up indicating a complete buddy check

B. Buddy Check with Rappellers
   Have rappellers perform buddy checks following guidelines above
Lesson 4 - Ground Training

I. Objectives

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

II. Training Aids

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

III. Responsibilities

A. Equipment Division

1. Set up training structures with ropes

B. Lead Instructor

Demonstrate method to rig and derig descender

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

C. Check Spotter

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

IV. Field Practical

A. Stage One - Stationary

One rappeller per rope

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

1. Rigging
   a. Descender in left hand
   b. Unlock handle
   c. Push button in and open cover
   d. Grasp rope with right hand, thumb towards anchor
   e. Route rope clockwise around cam
   f. Close cover, button out
   g. Lock handle
2. Inspecting
   During inspection, have the rappeller inspect the descender while holding the rope to the ground, alternating hands throughout the lesson.
   a. Rope from anchor, enters at groove
   b. Carabiner captured
   c. Button out
   d. Rope exits at bobbin
   e. **Handle locked**
   f. Rappeller waits be inspected by spotter
   g. Spotter check:
      i. Rope from anchor, enters at groove
      ii. Carabiner captured
      iii. Button out
      iv. Rope exits at bobbin
      v. **Handle locked**

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

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

B. Stage Two – Suspension

1. Spotter briefs the following:
   a. BD bag is utilized
   b. Everything is verbalized aloud
   c. Right hand positioned near the descender to route rope over the lip
   d. Looking down the rope
   e. Braking
   f. Rope on right side of body
   g. Avoid stepping on rope
3. Instructions and demo for rappeller suspension
   a. Climb stairs and stand with rope in front of body
   b. Rig descender, inspect, and then wait to be inspected by spotter
      i. During the inspection, have rappeller inspect the descender while holding the rope to the ground alternating hands (to simulate outboard hand on rope)
   c. Spotter checks descender and then places rappeller in suspension with left hand on descender with handle in locked position.
   d. Spotter instructs rappeller to move handle with left hand to primed position.
   e. With right hand just below the descender, tunnel rope over lip, rappeller looking over right shoulder, brake, and repeat until they reach the ground.
   f. Once on ground, rappeller manipulates cam with thumb to gain slack, opens cover, and removes rope to derig descender.
   g. Have the rappeller complete steps a-f until competency is obtained.

C. Stage Three – ISC D4 Descender - Panic Stop Feature

   1. Spotter briefs the following:
      a. Lead instructors will have all rappellers hold their descenders in left hand with the cover open exposing the cam. Demonstrate how when the handle is rotated around it will eventually initiate the panic stop. After the panic stop initiates demonstrate the two ways to recycle the handle. 1) Counterclockwise until the device recycles and then continue rappel. 2) Clockwise until the handle locks and then continue rappel.
      b. A demo rappeller will then stand at a suspension station with a spotter and rig the descender. With the spotter holding the rope to simulate rope weight the rappeller will initiate the panic stop. The rappeller will then cycle the handle to continue the rappel both ways.
      c. Have the rappeller complete process until competency is obtained.

D. Stage Four – Proper Descender Orientation – Resetting

   1. Spotter briefs the following:
      a. During the rappel process the rope can come off the lip of the descender. This happens when slack is introduced to the system i.e., panic stop, ragdoll exit off of the skids, fast stop, etc. or by pressure being put on the device by the helicopter rising with the rope fastened to a fixed object on the ground. Both of these instances can lead to the descender not braking properly.
      b. If the rope comes off the lip, the rappeller needs to return it as soon as they become aware.
      c. A demo rappeller will be in suspension and demonstrate how to place the rope back on the lip before continuing the rappel from both a slack-induced and canted device.
         i. For a slack induced instance have the rappeller simply place it back over the lip.
         ii. For a canted device have a spotter pull down on the rope to cant the device so the rope is on the bobbin and when pressure is released the rappeller will replace the rope over the lip and continue the rappel.

E. Stage Four – Misrigged Descenders

   1. Spotter briefs the following:
a. Instructor shall demonstrate to rappellers the way the descender can be incorrectly rigged and dangers associated with a non-arrested fall to the ground.

b. Each rappeller will inspect the descender from a first-person point of view and notify spotter if misrigged.

c. The last descender seen by rappeller will be a rigged correctly.
Descender rigged correctly

Descender rigged backwards

Descender rigged with carabiner captured in groove

Descender rigged with rope between cover

Rigged with the rope into the carabiner attachment point (CAP) three ways. From left to right: from anchor into the CAP, from anchor in the groove and out the CAP, rigged backwards and out the CAP.
Lesson 5 - Spotter Checks

I. Objectives

- Demonstrate proper spotter check without error

II. Training Aids

- Personal spotter gear
- Suitable open area

III. Responsibilities

A. Demonstrators

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

B. Lead Instructor

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

C. Check Spotter

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

IV. Field Practical

Instructor(s) will now start individual rappeller instruction on procedures
Rappellers shall follow the spotter check sequence as demonstrated
Spotter Check Demonstration:
Veteran rappellers will demonstrate the correct spotter check steps
No tactile checks

*Italicized words in parentheses are for instructing purposes only and not verbalized as part of the check*
A. Spotter Check with Instructor Notes

1. Flight helmet
   a. In good condition (no cracks or damage, avionics in place, no eye protection required)
   b. Chin strap in place

2. Nomex shirt
   a. Shirt collar up, buttoned to the top and tucked in, or flight suit fully zipped
   b. Sleeves down

3. Gloves
   a. In good condition (Nomex flight glove, PMI GS2200 or Metolius climbing ¾ finger with Nomex flight gloves. Gloves shall have no holes and be free of contaminants)

4. Harness
   a. Chest and leg straps buckled
   b. Snug fit
   c. Webbing and stitching in good condition
   d. No twists
   e. Loose ends secured

5. Nomex pants
   a. Pants over boots

6. Raptor knife
   a. In sheath
   b. Snap secured
   c. Lanyard stowed
   d. Horn facing to the left

7. Signal spotter to turn around with a tap on the knife sheath

8. Helmet in good condition

9. Harness
   a. Webbing and stitching in good condition
   b. No twists
   c. Loose ends secured
   d. Spotter tether attached to dorsal D-ring and tacked
   e. Extendable tether locked, and snaps secured
   f. Carabiner in place at end of tether

10. Signal spotter to turn around with a single tap on the left shoulder

11. Exchange thumbs-up indicating a complete spotter check

B. Spotter Check for Rappellers

Instruct rappellers to perform spotter checks using the guidelines above.
Lesson 6 - Ground Simulator

I. Objectives

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

II. Training Aids

Rappel configured Bell medium helicopter or simulator

III. Minimum Requirements

- A minimum of 8 ground simulations
- A minimum of 1 error-free cycle from each seat
- A minimum of 1 error-free re-entry from each side (a successful re-entry will count as an error free cycle)

IV. Responsibilities

A. Demo Rappellers

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

B. Lead Instructor

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

C. Check Spotter

1. Penalties will be assessed after the rappeller’s fourth ground simulator cycle.
2. Change blindness will be utilized at the discretion of the check spotter and be clearly communicated to all cadre and rappellers in the class.
D. Spotters
   1. Monitor rappellers’ progress through ground simulator training
   2. Coordinate with lead instructor on meeting objectives of training
   3. Monitor rappellers for fatigue and allow for breaks

V. Introduction of Hand Signals

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

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

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

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

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

VI. Additional Ground Simulator Points to Cover

Introduce hand placement while spotter is checking seatbelts and rappeller tethers. Rappellers do not need to buckle seatbelt behind them. Introduce foot trap while rigging descender. Emphasize the three-step technique to reach the skid, no double-stepping the flight step. Introduce the use of the outboard hand on the rope to the ground and inboard hand on the rappeller tether when presenting. Utilize the rope as a handhold and not the carabiners or the door.
VII. Ground Simulator – Stage One

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

VIII. Ground Simulator – Stage Two

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

1. Rappeller:
   a. Removes seatbelt and slides to edge of seat
   b. Rigs descender with foot trap utilizing outboard foot
   c. Inspects rigged descender, with outboard hand grasping free end of rope (rope going to ground) and inboard hand inspecting descender
      i. Rope from anchor, enters at groove
      ii. Carabiner captured
      iii. Button out
      iv. Rope exits at bobbin
      v. **Handle locked**
   d. Presents with outboard hand on the rope to the ground and inboard hand on rappeller tether between harness and seatbelt ring (not release)

LI. Spotter tactically inspects rigged descender and visually ensures the rappeller tether is attached.

1. Rope from anchor, enters at groove
2. Carabiner captured
3. Button out
4. Rope exits at bobbin
5. **Handle locked**
6. Rappeller tether attached

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

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

LIII. Spotter gives “Begin Descent” signal

1. Rappeller:
   a. Releases rappeller tether
   b. **Ensures rope is over the lip** and begins transitioning off of skid looking at the anchor. Once off skid, stop, ensure rope is over the lip, and descend to ground while maintaining on-rope situational awareness.

LIV. Once on ground, rappeller manipulates cam with thumb to gain slack, opens cover, and removes rope to derig descender
IX. Ground Simulator – Stage Three

A. Additional Hand Signals

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

1. Return to Seatbelt

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

<table>
<thead>
<tr>
<th>NOTE - Demonstration Rappellers</th>
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<tbody>
<tr>
<td>At completion of demo cycle, one rappeller will demonstrate the sequence with a misrigged descender and/or demonstrate an attempted rappel with rappeller tether attached.</td>
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</tbody>
</table>

a. Additional re-entry points to cover

i. Must re-enter the aircraft the same way as exited, utilizing the three-step process in reverse.

ii. Utilize the rope between carabiner and descender as additional aid if needed.

iii. Do not grab door or carabiners to assist aircraft re-entry.

iv. A “Return to Seatbelt” signal may be given at any time after the seatbelt has been removed. Trainers should utilize this signal throughout the rappel sequence. However, rappellers must be in ready position on the skids to count as a re-entry for minimum training requirements.

v. Do not pull on handle or rappeller tether when returning to seatbelt.

vi. Introduce the Rappeller and Spotter Knives and the reasons for them.
Notes
Lesson 7 - Elevated Simulator

I. Objectives

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

II. Training Aids

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

III. Minimum Requirements

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

IV. Outline of Rappels:

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

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

   Re-entries (minimum of one from each side)

* Demo Suspension ETO
  Suspension ETOs

* Demo Elevated Simulator ETO

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

A. Demonstrators
   1. Lead instructor shall narrate the process.

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

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

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

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

VI. Additional Elevated Simulator Points to Cover

Ropes may stay deployed after first cycle.
Knots will only be considered knots when they are above the rope bag, prusik or weight.
VII. Elevated Simulator – Stage One

A. Rappellers perform buddy check

B. Spotter checks the rappellers outside the simulator

C. First rappellers to board simulator on each side perform visual and tactile check on equipment, move into seat, fasten rappeller tether to inboard side of the webbing bridge with release handle facing downward, and then fasten seatbelt.

D. Last rappeller loaded performs spotter check and gives “Thumbs-up”

E. Spotter checks rigging, taps inboard rappellers’ BD bags, and gets “Thumbs-up” signal

F. Spotter checks rappeller tethers and seatbelts

G. Spotter attaches spotter tether, takes seat, connects seatbelt

H. Spotter presents attached carabiner to rappellers, rappellers confirm and exchange “Thumbs-up” signal.

I. Outboard rappellers will secure rope bags.

J. Spotter removes seatbelt and moves into position

K. Spotter opens doors and deploys ropes

L. Spotter gives rappeller “Remove Seatbelt” signal (one rappeller at a time)

   1. Rappeller:
      a. Removes seatbelt and slides to edge of seat
      b. Rigs descender
      c. Rappeller inspects rigged descender, with outboard hand grasping free end of rope (rope going to ground) and inboard hand inspecting descender
         i. Rope from anchor, enters at groove
         ii. Carabiner captured
         iii. Button out
         iv. Rope exits at bobbin
         v. Handle locked
      d. Presents with outboard hand on the rope to the ground, and inboard hand on rappeller tether between harness and seatbelt ring (not release)

M. Spotter tactilely inspects rigged descender and visually ensures the rappeller tether is attached.

   1. Rope from anchor, enters at groove
   2. Carabiner captured
   3. Button out
   4. Rope exits at bobbin
   5. Handle locked
   6. Rappel tether attached
N. Spotter gives “Move to Skid” signal (one rappeller at a time)

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

O. Spotter gives “Begin Descent” signal

1. Rappeller
   a. Releases rappeller tether.
   b. Begins transitioning off skid looking at the anchor. Continue transition to an inverted state. Rope should touch the skid before the feet come off skid.
   c. Once off skid, stop, ensure rope is over the lip, and descend to ground.
   d. Once on ground, manipulate cam with thumb to gain slack both above and below the descender, open cover, and remove rope to derig descender. (If rappeller is unable to derig the descender due to a damaged cover, no available slack, a knot into the bobbin, etc. rappeller should open carabiner to remove the descender.)

VIII. Elevated Simulator – Stage Two

A. Introduction of Knots

1. Review the “Knot-in-Rope” signal (finger pointing down the rope) and response (head nod).
   a. Discuss the kinds of knots possible (loop, overhand, and tangles)
   b. Have veteran rappeller demonstrate knot procedures
   c. Lead instructor to brief demonstrators again on slowing down and being methodical
   d. Discuss timeframes when working a knot
   e. Brief on stopping above the problem and fixing the problem
   f. Brief on ensuring rope is over the lip before continuing rappel after removing knot.
   g. Brief on the difference of starting a rappel with no rope weight versus full rope weight.

2. During the first rappel with a knot, the spotter will signal to the rappeller that there is a knot in the rope before giving the “Remove Seatbelt” signal. After the rappeller’s first knot, it will be emphasized that the signal may come at any time during the rappel sequence.

3. The rappeller will acknowledge with the appropriate head nod response before progressing any further in the rappel sequence.

4. If the rappeller sees a knot when clearing the rope, it is their responsibility to signal to the spotter that there is a knot in the rope.

5. Instruct rappellers that the spotter may send the rappeller if they feel the problem is fixable.

6. Rappeller will remove two weighted knots. Additional weighted knots will be removed during Stage Four.

7. Rappeller will perform two error-free rappels with weighted knots in rope. Ground spotter
ties knot in rope.
IX. Elevated Simulator – Stage Three

A. Weighted Re-entries

1. After rappeller completes a re-entry procedure, the doors will be shut and secured.
2. Rappeller will discuss any needed feedback with the spotter. Spotter will then remove the rope from the descender; rappeller will remove seatbelt and exit the simulator.
3. Simulation for the inside rappellers will continue as if the outside rappellers had rappelled to the ground. Repeat step two.
4. Rappeller will complete one weighted simulator re-entry from each side.
5. Rappellers can complete buddy checks on the elevated simulator and begin process of re-boarding for additional rappels.
6. Do not pull on handle or rappeller tether when re-entering the simulator.
Lesson 8 - Emergency Procedures

I. Objectives

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

II. Responsibilities

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

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

C. Lead Instructor
   1. Brief with demo rappeller(s) on expectations (slow, methodical, verbalize)
   2. Brief rappellers on objectives of station and how ETO training will be conducted
   3. Discuss reason for conducting an ETO
   5. Discuss possibility of being lowered to the ground, no signal
   6. Discuss maintaining situational awareness
   7. Discuss possible live scenarios that could happen

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

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

IV. ETO Suspension

Following instruction and demonstration, rappellers shall perform ETOs from suspension

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

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

V. ETO Elevated Simulator Demonstration

Lead trainer verbalizes the ETO process as demonstrated by veteran rappeller(s)
VI. Elevated Simulator - Stage Four

A. ETO Elevated Simulator Process

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

B. Elevated Simulator – Stage Five

A. Completion of Elevated Simulator

1. Complete remaining 10 static-line rappels
2. Additional items such as random knots, typical terrain items (logs, tires, rocks, etc.), etc., should be used
3. Brief to the effect of a “ground-belay” coming from such obstacles as roots, trees, rocks, shrubbery, etc.
4. Brief to the effect of the “self-belay” coming from attempting to brake with the hand below the descender.
5. When rappeller encounters an obstacle, the rappeller will clear the obstacle by pulling rope out of the obstacle until there is clear rope to the ground. Then replace rope over the lip of descender and continue the rappel.
6. Explain the rappeller must maintain situational awareness and be alert to the possibility the aircraft may lift them back off of the ground. To help prevent this, the rappeller must ensure sufficient slack is available to properly derig the descender and remove rope prior to opening the cover.
7. Before end of elevated simulator, rappeller will practice cutting an unloaded rope held by an instructor.

B. Additional Live Rappel Hand Signals
1. Bad Rope
   Given by rappeller to spotter to indicate there is something wrong with the rope and the spotter should drop it

2. Discontinue Rappel
   Given by rappeller to spotter to indicate a bad rappel site and to discontinue the rappel.
Notes
Lesson 9 - Helicopter Mock-Ups

I. Objectives

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

II. Training Aids

Rappel configured Bell medium helicopter

III. Minimum Requirements

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

IV. Responsibilities

A. Equipment Division
   1. Rig aircraft with rappel equipment

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

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

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

V. Additional Mock-up Items

After a re-entry, a rappeller will derig their descender; the process ends at that point. Full spotter PPE must be worn for the entire lesson.
There will be no change blindness on a rappeller’s last cycle.
Lesson 10 - Helicopter Rappels

I. Objectives

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

II. Training Aids

Rappel configured Bell medium helicopter

III. Minimum Requirements

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

IV. Responsibilities

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

A. Equipment Division

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

B. Lead Instructor

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

C. Check Spotter

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

D. Spotters

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

E. Ground Observers

1. Assign a qualified spotter and at least one veteran rappeller to each rappel site.
2. The spotter must critique each rappeller.
V. Live Rappel Sequence – Rappels 1 - 3

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

A. Rappels 1-2

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

Following the second rappel, shut down and debrief.

B. Rappel 3 – ETO

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

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

Following ETO, shutdown and debrief
VI. Live Rappel Sequence – Rappels 4-8

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

A. Pre-Rappel Briefing

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

1. Typical terrain rappelling is very dynamic
2. Rappellers need to gather quick situational awareness pertaining to the rappel site when they check their rope and throughout the rappel
3. Speed control on the rope is critical to maintain situation awareness and ensure the ability to stop well above a problem
4. Slope is very deceiving. Rappellers should understand how to slow their descent and to check the slope, square up landing, position, and stabilize themselves to face uphill if possible, prior to derigging. Exit the site to a safe area visible to the spotter or pilot.
5. Timing – If rappellers find themselves swinging, learn to time the descent and swing to take advantage of open space below and to avoid impinging or tangling in timber.
6. Understand the type of timber at the rappel site. For example, Ponderosa pines are not very forgiving (i.e., not the type one can slide through well) whereas when in fir trees, a rappeller may be able to brush along the side of the branches and fight through it reasonably well.
7. It is critical that the rappeller constantly monitors the route of travel to the ground. The helicopter might drift around the spot leaving the rappeller to find themselves on the other side of the tree in short order. Again, this is when timing is an advantageous quality that must be identified and managed. Don’t go past the point of no return!
8. If a helicopter gains elevation during a rappel and your rope is entangled in an obstacle a “ground-belay” situation can occur.
9. Do not pull down on a rappeller’s rope when assisting them to clear an obstacle. This may inadvertently allow rope to pass through the descender, causing the rappeller to descend with limited control in a “ground-belay” situation.
10. Upon landing rappeller must maintain situational awareness and be alert to the possibility the aircraft may lift them back off of the ground. To help prevent this, the rappeller must ensure sufficient slack is available to properly derig the descender and remove rope prior to opening the cover.
B. Reconnaissance of Rappel Site(s)

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

C. Communications

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

D. Rappels 4-8

4. 300 feet in tall open canopy
5. 150-300 feet in open canopy with sloped ground
6. 150-300 feet in open canopy where rappellers may encounter obstacles
7. 150-300 feet in more closed canopy where rappellers will likely encounter obstacles
8. 150-300 feet in more closed canopy where rappellers will likely encounter obstacles
Appendix B – Rappel Spotter Training Syllabus

I. Introduction
The rappel spotter is the key position for 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 his/her role. **This appendix will need to be reviewed/updated during the 2021 NROG review revision cycle. Refer to the Spotter Trainee Job Aid (taskbook) for current minimums, i.e., Elevated simulator, mock-ups, live spots, etc.**

II. Training Objectives
Provide a spotter trainee with the tools, training opportunities, understanding and experience to perform as a rappel spotter.

III. Training Aids
National Rappel Operations Guide
PowerPoint (optional)
Individual lesson aids and lesson materials
Student Workbook
Rappel Spotter Training Qualification Record, found in Appendix C, serves as a training guide and documentation for initial spotter training
Instructors should also incorporate personal experience wherever illustrative or appropriate to enhance the concepts and learning

IV. Lesson Agenda
Lesson 0 – Pre Work
Lesson 1 – Policy and Procedures
Lesson 2 – Documentation and Administration
Lesson 3 – Hazards and Limitations
Lesson 4 – Communication
Lesson 5 – Equipment
Lesson 6 – Cargo Letdown/Simulator

Lesson 7 – Simulator/Live Rappels

Lesson 8 – Simulated Mission
Lesson 1 – Standards and Procedures

I. Objectives

Discuss how to maintain compliance with all applicable agency and interagency standards and procedures

II. Training Aids

NROG

Applicable agency manuals, guides and handbooks

Management plans, e.g. local fire, aviation, base, and mishap response plans

Rappel Spotter Training Qualification Record

III. Outline

A. Policy

1. National Rappel Operations Guide contains standards for:
   a. Spotter prerequisites
   b. Spotter training
   c. Fitness
   d. Proficiency

2. Agency specific regulations and policy

B. Procedure

1. Applicable portions of unit fire management plans
2. Base rappel operations plan
3. Initial attack dispatch procedures
4. Off-forest rappel procedures
5. Large incident operations
6. Standard initial attack loads (numbers and equipment)
7. Training and proficiency schedule
8. Booster rappellers plan (if applicable)
Lesson 2 – Documentation and Administration

I. Objectives

Review spotter documentation forms.

Discuss the importance of timely and accurate rappel documentation as outlined in NROG Chapter 7

II. Training Aids

NROG Chapter 7 and Appendix C

III. Outline

Instructor should review all appropriate forms and stress the importance of keeping thorough and up-to-date equipment, training and Spotter Qualification Record.
Lesson 3 – Hazards and Limitation

I. Objectives

Discuss and interpret potential hazards encountered during rappel operations

Demonstrate risk management evaluation skills

II. Training Aids

NROG

SafeCom, SafeRap reports


Photos and video footage of past rappel fires to simulate size-up exercise

IRPG (aviation pages 45-63, specific hazards pages 19-33)

NSHO

Pilot (perspective, aircraft limitations, flight manual overview)

III. Outline

A. Hazards

Discuss hazards that could have an impact on rappel operations. These include, but are not limited to:

1. Weather Conditions

   a. Winds and instability: Pilot and spotter should look for weather and wind signs that could indicate turbulence or downward movement of air at destination. Any of the following conditions may be an indicator of hazardous landing, rappelling, or firefighting conditions:
i. A good indicator on fires is the smoke column. Is it shifting direction, laying horizontal or blowing downhill? Is it plume dominated?
ii. Are there thunderstorms in the area?
iii. Is there increased turbulence when flying on the lee side of ridges or geographical prominences?

(Stress to trainee that even through the pilot has the ultimate responsibility for the mission’s safety, the spotter must use sound judgment and abort the mission if conditions exist that he/she deems unacceptable or unsafe)

2. Terrain
   a. Shadows
   b. Fire behavior

3. Equipment
   a. Equipment malfunctions (rappeller/spotter)
   b. Equipment malfunctions (helicopter)

Review weather and environment-related SAFECOMs/SafeRaps

B. Mission Limitations

Discuss the effects the following can have on mission success:

1. Aircraft Performance
   a. Altitude
   b. Temperature
   c. Payload
   d. Center of gravity (weight and balance)
   e. Fuel load

2. Crew limitations
   a. Fatigue
   b. “Can-do” attitude

C. Risk Management

1. Review the rappel risk assessment for fire missions

2. Stress the importance of following a procedure for sound risk management in all aspects of a mission
3. Perform pre-flight risk assessment and mitigation to include manifests, load calculation, weather, fuel quantity, flight hazards and communications

4. The GAR Risk Assessment model should be used as the standard risk assessment tool for mission planning purposes

5. After Action Reviews (AAR) – stress the value of utilizing AAR as part of good risk management.

6. Additional keys point to discuss
   a. Emergency challenge and response, risk management
   b. Discuss mission options (off-loading some personal and cargo, site selection to achieve better helicopter performance)
   c. Refuse assignment if necessary and alternatives.
   d. Address risks and hazards that may be present during site selection
Lesson 4 – Communications

I. Objectives

Demonstrate proper hand signals for communications to rappeller without error.

Discuss guidelines for proper communications with area dispatch.

Demonstrate ability to effectively communicate verbally between pilot/spotter and non-verbally between rappeller/spotter.

II. Training Aids

NROG Chapter 5 and 6, hand signals, current challenge and response language, simulation cards, etc.

Trainer will use current challenge and response language

III. Outline

A. 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:

1. What is the mission
2. Where is the mission
3. Potential hazards
4. Pre-flight and in-flight checks
5. Trigger points for aborting the mission
6. Emergency procedures
7. AAR with crew/pilot/spotter

B. Pilot and Spotter Communications

“Challenge and response” is a required communication procedure between the pilot and spotter. Throughout the rappel process, “go” or “no-go” decisions must be relayed before proceeding to the next step.
Challenge and response requires a simple response from the pilot before the spotter can complete a step in the rappel sequence.

During the rappel sequence, there are critical times when the spotter needs specific information from the pilot, e.g., prior to sending rappellers, the spotter and pilot must communicate that power settings are within limits. It is important the trainee understands the meaning of “power is good.” Brief trainee on limitations such as, max temps, max torque, etc.

It is essential that the spotters and pilots use standard communications for all rappel operations. All communications must be clear, concise and understood. The following standardized terminology is to be used during normal rappel operations:

1. **Directional Movement**
   a. Aircraft must be visually and verbally cleared before moving
   b. Stating a directional distance or hover status will assist the pilot in moving and settling over the rappel spot e.g., spotter may state “we are drifting, hold, main/tail are clear, move right 50 feet”
   c. Directions must be relative to the pilot’s perspective, e.g., left, right, forward, back, up, and down

2. **Procedural Communications**
   a. “Power is good.”
   b. “One minute out, airspeed below 40 knots.”
   c. “Opening aircraft door(s).”
   d. “Reset master caution.”
   e. “Ready to drop ropes, how is the power?”
   f. “Rappellers hooking up.”
   g. “Rappeller(s) to the skids.”
   h. “Ready to send rappellers(s), how is the power?”
   i. “Sending rappeller(s).”
   j. “Rappellers(s) off the skid... half way... on the ground.”
   k. “Derigging ropes.”
   l. “Right side/left side rope away, right side/left side door shut.”
   m. “Clear to depart.”
C. Spotter and Rappeller Communications

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

D. Flight Following Communications

E. Review standard flight-following procedures

F. Operational Communications

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

1. Size up (IRPG)
2. Landing to configure (latitude/longitude)
3. Over rappel site; Adjust radios to reduce external distraction
4. Rappel complete, establish communication with inserted rappellers, and ensure they have positive communications with dispatch, helibase, etc
5. Reference and review flight following procedures:
   a. AFF
   b. 15-minute check ins
   c. Contact with air attack
Lesson 5 – Equipment

I. Objectives

Identify rappeller/spotter equipment and demonstrate inspection and care of that equipment

Recognize proper utilization and care of rappel equipment, including PPE

II. Training Aids

NROG Chapter 4

NTDP website

Spotter harness with tether, rappel and letdown equipment

Review anchor inspection requirements from the STC installation instructions

III. Outline

A. Inspection

1. Review equipment requirements and standards in NROG

2. Instruct trainee in the proper methods of equipment inspection:

   a. 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.

   b. Stress to the trainee that even through the rappeller is responsible for inspection and maintenance of their equipment, the spotter is ultimately responsible for monitoring the use and care of all rappeller and spotter equipment. All equipment requirements and standards can be found in the NROG or the NTDP website.
Lesson 6 – Cargo Letdown

I. Objectives

Describe the function of all cargo letdown equipment

Demonstrate proper cargo letdown configuration

Demonstrate proper cargo letdown procedures without error

Demonstrate effective communications with pilot

II. Training Aids

NROG Chapters 4, 5 and 6

Gather all cargo letdown equipment

Pilot should be present during this phase of the training

III. Outline

A. Ground Training

1. Review cargo letdown procedures
   a. Familiarize trainee with cargo equipment
   b. Review applicable portions of NROG
   c. Reference challenge and response in Ch. 5 and emergency challenge and response in Ch. 6 of the NROG

2. Familiarize trainee with spotter equipment checks
   a. Stress that the spotter is responsible to ensure all equipment is in good condition and properly fitted

3. 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

4. Demonstrate anchor inspection

5. Demonstrate placement and securing of cargo

6. Demonstrate pre-flight checks, e.g. spotter equipment checks, hook check etc.
7. Demonstrate cargo configuration procedures.

8. Demonstrate cargo letdown procedures, including spotter and pilot communications, and emergency procedures.

B. Elevated Platform/Mock-up Training

Under the supervision of a qualified spotter, trainee will perform the following:

1. Install and secure cargo and cargo letdown equipment

2. Inspection of rappel bracket and spotter anchor

3. Simulate aircraft pre-flight check (walk-around)

4. Complete a minimum of 12 mockups and 12 elevated platform cargo spots including emergency procedures prior to spotting live

5. Demonstrate deployment of various cargo configurations, e.g. single box, two boxes, single box and cubee

6. Complete last four cargo mockups without procedural error to include challenge and response communications

7. Demonstrate split loads of rappellers and/or cargo

C. Helicopter Deployment

Under the supervision of a qualified spotter, trainee will perform the following:

1. Install and secure cargo and cargo letdown equipment

2. Complete inspection of rappel bracket and spotter anchor

3. Perform aircraft pre-flight check (walk-around)

4. Complete 8 cycles without procedural error at low, medium and high heights, 4 cycles shall be in typical terrain

5. Maintain Rappel Spotter Initial Training Qualification Record

The instructor will return the trainee to the appropriate level of training for review if he/she makes repetitive procedural errors during live cargo deployment.
Lesson 7 – Simulator/Live Rappels

I. Objectives

A. Performance Criteria

1. Demonstrate proficiency in spotting rappels from an elevated platform

2. Spot 12 complete rappel cycles from the elevated platform
   a. Four cycles shall include emergency procedures
   b. Final four cycles shall be accomplished without procedural error to include one cargo letdown

3. Demonstrate ability to effectively communicate verbally and non-verbally

4. Spot a minimum of 12 mock-up cycles
   a. Four cycles shall include emergency procedures
   b. Final four cycles shall be accomplished without procedural error to include one cargo letdown

5. Under direct supervision of qualified spotter and prior to a final check ride, a spotter shall:
   a. Spot a minimum of 20 live cycles, (10 without procedural error), at low, medium and high height as outlined below
      i. Fifteen cycles in typical terrain
      ii. Six cycles including the deployment of cargo.
      iii. Four operational
      iv. One split load (rappellers and cargo)
      v. One ETO

II. Training Aids

NROG Chapters 4, 5 and 6

III. Outline

A. Elevated Simulator

1. Trainee will demonstrate:
   a. Anchor inspection
   b. Proper configuration of cargo for deployment (as appropriate by specific simulator)
c. Proper attachment of carabiners and ropes to anchor points
d. Proper sequence for loading rappellers including:
   i. Attaching equipment
   ii. Completed buddy checks
   iii. Spotter check
   iv. Final checks prior to launch
e. In-flight procedures
f. Fire/rappel spot size up and evaluation
g. Selection of emergency site
h. Contact with dispatch
   i. Proper sequences for deploying rappellers and cargo
      i. Offsite power check
      ii. Confirming mission is a go
      iii. Setting up over rappel site
      iv. Deployment of ropes
      v. Use of hand signals to remove seat belts
      vi. Use of knot in rope signal and acknowledgement (if applicable)
      vii. Use of hand signals to send rappellers to skids
      viii. Final checks
      ix. Use of hand signals to send rappellers
      x. Derigging and dropping ropes
      xi. Cargo deployment
      xii. Departing rappel site and reestablishing communications

B. Emergency Procedures

1. 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.

2. The trainee will demonstrate, using equipped rappellers, all established emergency procedures. At a minimum, the NROG 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.
C. Mock-Ups

1. Instructor will demonstrate anchor inspection, aircraft configuration, loading of rappellers, preflight check, in-flight procedures, and the deployment of rappellers and cargo. Instructor will verbalize standard spotter/pilot communications (including emergency procedures) throughout the demonstration.

2. Trainee will complete a minimum of 12 cycles, utilizing a standard load of two or four rappellers and cargo. Four cycles shall be without procedural error.

3. Scenarios should be incorporated to enhance spotter training.

D. Helicopter Deployment

1. Under the supervision of a rappel spotter, the trainee will perform the following:

2. Configure the aircraft for a rappel mission (inspect rappel equipment, secure cargo load), and complete a minimum of 20 rappel cycles at low, medium and high heights. Fifteen of these deployments will be in typical terrain, six shall include cargo. One ETO and one split load shall be completed before final evaluation.

3. The instructor will return the trainee to the appropriate level of training for review if he/she makes repetitive procedural errors during live helicopter deployment.
Lesson 8 – Incident Simulation

I. Objectives

Successful demonstration of spotter competency and knowledge from an elevated platform or helicopter during training

II. Training Aids

SafeRap

Spotter Qualification Record

Relevant operating plans

Photos or video footage of past fires and fuel type

Sand table

III. Outline

A. Simulation Logistics

1. Instructor will preselect a location for a simulated fire

2. Instructor will coordinate with local dispatch center, FMO and other necessary personnel to facilitate live training scenarios

B. Tasks to be completed

1. Trainee will ensure that the helicopter and initial attack personnel are prepared for an IA mission

2. Trainee will demonstrate the correct operational procedures to respond to an IA dispatch call

3. Trainee will assist pilot with navigation and communications while enroute to simulated fire

4. Trainee will provide a fire size-up and other applicable information to dispatch

5. Trainee will demonstrate the appropriate procedure to prepare for a rappel

6. Trainee will successfully deploy a minimum of one stick of rappellers and perform all operational procedures
7. Trainee will ensure deployed rappellers have established communications, will reconfigure helicopter and return to base

C. Post Mission

1. Trainee will complete mission documentation forms and conduct AAR

2. Successful completion of the scenario does not replace a final evaluation by a check spotter
Appendix C – Forms

On the following pages of this appendix are forms to be used for rappel program documentation purposes. Equipment records and Rappeller and Spotter Unit Logs shall be documented in either the hard copy forms provided in this appendix or in an electronic equivalent. For initial certification and recertification documentation, the forms provided herein will be completed and maintained.

These and the additional forms provided will allow individual rappel programs to organize and document the histories of equipment and training. They were designed to contain all of the pertinent information that has been recommended or required by this guide.
## Form C-1 Rappel Equipment Inspection Form

**Circle One:** Rappel Harness  Spotter Harness with Spotter Tether  Spotter Harness  Spotter Tether  Rappel Rope  Letdown Line  Descender  Rappeller Tether  ARS

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Form C-2 Rappel/Spotter Log

Name: _________________________  Circle One:  Rappel Log  Spotter Log

Previous Operational:_______  Previous Non-Operational:_______  Total:_______

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# Initial Certification Rappeller Training Record

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## Lesson 1 – Equipment Orientation, Issue, Fit & Suspension
- **Home Unit**

## Lesson 2 – Program Overview and Equipment Review
- **Classroom Session**

### Lead Trainer Initials

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## Lesson 4 - Ground Training

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## Lesson 5 - Spotter Checks

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## Lesson 6 - Ground Simulator

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## Lesson 7 - Elevated Simulator

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## Lesson 8 - Mock-Ups

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## Lesson 9 - Live Helicopter Rappels

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## Final Check Spotter Certification

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II. Instructions for Completing Initial Rappeller Training Documentation

All initial rappeller training will be conducted under the supervision of a qualified spotter with check spotter oversight. Elements must be presented and performed in sequential order. Each training element will be assessed and signed off by the evaluating spotter. Comments shall be included in the space provided to ensure appropriate documentation of performance and to provide feedback to trainees. Each requirement of the Rappeller Training Record shall only be signed off once the trainee demonstrates adequate knowledge and understanding of the standards or receives the appropriate training.

Trainees will be assigned to squads and will be overseen by a squad leader. Squad leaders are accountable for tracking rappellers’ progression through all stations, communicating with lead instructors, and maintaining the wellness of the squad. The squad leader is responsible for accurately documenting all necessary information in each candidate’s training documentation. It’s critical that the squad leader accurately documents penalties and captures notes on continual errors by utilizing the provided tracking sheets. Squad leaders must maintain timely communications with the spotter trainers. Squad leaders shall not assess any penalties without direct consultation from a qualified spotter first.

A. Errors Which Invoke Penalties

A system of penalties is incorporated into rappel training starting at stage two of ground training. During the initial elevated simulator training, penalties will not be applied until the candidate has completed three rappels. Penalties will not be assessed until the candidate has completed two high 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. Major and minor penalties will reset once a candidate advances to live helicopter operations; however, continual errors will carry into live rappel operations. One major penalty during live operations will remove a candidate from training.

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

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

3. **Continual:** A “continual” error is defined as an error that occurs three or more times. After two warnings for the same error, the third occurrence and any thereafter are considered continual errors and at this point the candidate shall be assessed the appropriate penalty.
B. Appropriate Documentation

1. **Notes/Comments:** Make necessary comments specific to each training revolution in the provided space next to the evaluating criteria. If necessary, utilize the expanded notes page provided. It is critical to capture accurate notes once the feedback is provided by evaluating spotters.

2. **Pass/Fail:** To be determined by the evaluating spotter. The candidate must meet the objectives in the Rappel Training Syllabus prior to moving on to ground training.

3. **No Errors:** If there are no elements assessed as unsatisfactory, then the “no errors” box shall be checked. If an evaluating spotter doesn’t specifically mention that there was an unsatisfactory element, then it can be assumed that the revolution had “no errors.” Ask an evaluating spotter for clarification if necessary.

4. **Unsatisfactory:** If there is a deficiency in one of the evaluating criteria starting at low tower training, it shall be marked “unsatisfactory” by placing a “U” in the appropriate box and a comment shall be provided. If an element is assessed as “unsatisfactory,” the “no errors” box shall not be checked. Only an evaluating spotter may assess an “unsatisfactory.”

5. **Continual Error:** When continual errors begin to be assessed, they shall be documented through accurate notes and tracked on the provided documentation. Remember to capture the first two unsatisfactory performances and the resulting penalty on all occurrences thereafter. Continual errors may only be assessed by the evaluating spotter. Have discussions as needed with the evaluating spotter for clarification or direction on penalty documentation. If the squad leader observes continual errors that aren’t being recognized by the spotter trainers, then bring it up to the lead trainers at the appropriate time and place.

6. **Minor Penalty:** When a minor penalty is assessed by an evaluating spotter, the element shall be rated as “unsatisfactory” with a “U” and be accompanied by accurate notes on the occurrence in the provide space. Track the minor penalty on the provided documentation by checking the numbered boxes as the errors occur. It’s critical to remember that three minors constitute one major, making it very important to keep evaluating-spotters apprised of the candidates’ penalty status as they progress through training.

7. **Major Penalty:** When a major penalty is assessed by an evaluating spotter, the element shall be rated as “unsatisfactory” with a “U” and be accompanied by accurate notes on the occurrence in the provided space. Track the major penalty on the provided documentation by checking the numbered boxes and writing what the error was as it occurs. It’s critical to remember that three majors will remove the candidate from training, making it very important to keep evaluating-spotters apprised of the candidate’s penalty status as they progress through training. A check spotter shall be involved in assessing any major penalties.
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<th>Minors</th>
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<th>Rappel #</th>
<th>Notes</th>
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Minimum Requirements

1. Minimum of 8 ground simulations
2. During stage one a minimum of 1 error free cycle from each seat
3. During stage two a minimum of 1 error free re-entry from each side

Penalties will be assessed after the students 4th ground simulator cycle

Comments

If there is a deficiency in one of the areas below, it should be marked unsatisfactory (u) in the appropriate box. If no boxes are marked unsatisfactory, place an "x" in the no errors box.
Minimum Requirements

1. Complete three weighted simulator exits
2. Complete one weighted simulator re-entry from each side position on the skid/step to spotter's satisfaction.
3. Untie three weighted knots during simulator rappels
4. Complete three weighted emergency tie-off procedures (ETO)
5. Trainee will perform cumulatively a total of 10 static line rappels

*Penalties will begin to be assessed starting with the 3rd high tower rappel

<table>
<thead>
<tr>
<th>Rappel #</th>
<th>Equipment Care</th>
<th>Buddy Check</th>
<th>Spotter Check</th>
<th>Inspect Rigging</th>
<th>Seatbelt</th>
<th>Rappeller Tether</th>
<th>Response to Spotter Signals</th>
<th>Rig Descender</th>
<th>Transition to Skid</th>
<th>Other Rappel</th>
<th>Exit Off Skid</th>
<th>Situational Awareness</th>
<th>Speed Control</th>
<th>Stop Prior to Landing</th>
<th>Landing</th>
<th>Clear Rope</th>
<th>Remove Rappeller Tether</th>
<th>Rig Descender</th>
<th>Transition to Skid</th>
<th>Other Rappel</th>
<th>Exit Off Skid</th>
<th>Situational Awareness</th>
<th>Speed Control</th>
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<th>Situational Awareness</th>
<th>Speed Control</th>
<th>Stop Prior to Landing</th>
<th>Landing</th>
<th>Clear Rope</th>
<th>Remove Rappeller Tether</th>
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</thead>
</table>
| Initial Certification Rappeller Next Gen Training Record - Lesson 7 - Elevated Simulator Training

If there is a deficiency in one of the areas below, it should be marked unsatisfactory (u) in the appropriate box. If no boxes are marked unsatisfactory, place an "x" in the no errors box.

<table>
<thead>
<tr>
<th>Check When Completed</th>
<th>Comments</th>
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</thead>
<tbody>
<tr>
<td>No Errors *</td>
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</table>
If there is a deficiency in one of the areas below, it should be marked unsatisfactory (u) in the appropriate box. If no boxes are marked unsatisfactory, place an “x” in the no errors box.

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<th>Rappel #</th>
<th>Equipment Care</th>
<th>Buddy Check</th>
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<th>Inspect Rigging</th>
<th>Seatbelt</th>
<th>Rappeller Tether</th>
<th>Response to Spotter Signals</th>
<th>Rig Descender</th>
<th>Transition to Skid</th>
<th>Clear Rope</th>
<th>Remove Rappeller Tether</th>
<th>Exit Off Skid</th>
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**Minimum Requirements**

1. Perform helicopter mock-up rappels and re-entry procedures as initiated by the spotter, until proficiency is demonstrated from all seating positions.
2. An error free re-entry is counted toward the total number of successful mock-ups.

*The minimum number could be as little as four successful mock-ups*

**Comments**

**Error Free Cycle**

- [ ] Inside Right
- [ ] Inside Left
- [ ] Right Side
- [ ] Left Side

**Completed**

- [ ] Inside Right
- [ ] Inside Left
- [ ] Right Side
- [ ] Left Side
### Initial Certification Rappeller Next Gen Training Record - Lesson 9 - Live Helicopter Rappels

If there is a deficiency in one of the areas below, it should be marked unsatisfactory (u) in the appropriate. If no boxes are marked unsatisfactory, place an "x" in the no errors box.

<table>
<thead>
<tr>
<th>Rappel #</th>
<th>Equipment Care</th>
<th>Buddy Check</th>
<th>Spotter Check</th>
<th>Inspect Rigging</th>
<th>Seatbelt</th>
<th>Rappeller Tether</th>
<th>Response to Spotter Signals</th>
<th>Rig Descender</th>
<th>Transition to Skid</th>
<th>Clear Rope</th>
<th>Exit Off Skid</th>
<th>Situational Awareness</th>
<th>Speed Control</th>
<th>Braking</th>
<th>Stop Prior to Landing</th>
<th>Landing</th>
<th>Clear Rappel Site</th>
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IV. Initial Rappeller Training Record – Ground Simulator

If there is a deficiency in one of the areas below, it should be marked unsatisfactory (u) in the appropriate box. If no boxes are marked unsatisfactory, place an “x” in the no errors box.

Penalties will be assessed after the students 4th ground simulator cycle

<table>
<thead>
<tr>
<th>Rappel #</th>
<th>Equipment Care</th>
<th>Buddy Check</th>
<th>Spotter Check</th>
<th>Inspect Rigging</th>
<th>Seatbelt</th>
<th>Rappeller Tether</th>
<th>Response to Spotter Signals</th>
<th>Rig Descender</th>
<th>Transition to Skid</th>
<th>Clearing of Rope</th>
<th>Remove Rappeller Tether</th>
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Comments
V. Initial Rappeller Training Record– Elevated Simulator

If there is a deficiency in one of the areas below, it should be marked **unsatisfactory (u)** in the appropriate box. If no boxes are marked unsatisfactory, place an “x” in the no errors box.

1. Complete three weighted simulator exits
2. Complete one weighted simulator re-entry from each side position on the skid/step to spotter’s satisfaction.
3. Untie three weighted knots during simulator rappels
4. Complete three weighted emergency tie-off procedures (ETO)
5. Trainee will perform cumulatively a total of 10 static line rappels

*Penalties will begin to be assessed starting with the 3rd high tower rappel

<table>
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<th>Seatbelt</th>
<th>Rappeller Tether</th>
<th>Response to Spotter Signals</th>
<th>Rig Descender</th>
<th>Transition to Skid</th>
<th>Clear Rope</th>
<th>Remove Rappeller Tether</th>
<th>Exit Off Skid</th>
<th>Situational Awareness</th>
<th>Speed Control</th>
<th>Braking</th>
<th>Stop Prior to Landing</th>
<th>Landing</th>
<th>Clear Rappel Site</th>
<th>Weighted Rappel</th>
<th>Weighted Reentry Left Side</th>
<th>Weighted Reentry Right Side</th>
<th>Weighted Knot</th>
<th>Weighted ETO</th>
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VI. Initial Rappeller Training Record – Mock-Ups

If there is a deficiency in one of the areas below, it should be marked unsatisfactory (u) in the appropriate box. If no boxes are marked unsatisfactory, place an “x” in the no errors box.

Minimum Requirements
1. Perform helicopter mock-up rappels and re-entry procedures as initiated by the spotter, until proficiency is demonstrated from all seating positions
2. An error free re-entry is counted toward the total number of successful mock-ups.
*The minimum number could be as little as four successful mock-ups

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<thead>
<tr>
<th>Rappel #</th>
<th>Equipment Care</th>
<th>Buddy Check</th>
<th>Spotters Check</th>
<th>Inspect Rigging</th>
<th>Seatbelt</th>
<th>Rappeller Tether</th>
<th>Response to Spotter Signals</th>
<th>Rig Descender</th>
<th>Transition to Skid</th>
<th>Clear Rope</th>
<th>Remove</th>
<th>Exit Off Skid</th>
<th>No Errors *</th>
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Error Free Cycle Completed
- □ Inside Right
- □ Inside Left
- □ Outside Right
- □ Outside Left

Error Free Re-Entry
- □ Right Side
- □ Left Side

Comments
### VII. Initial Rappeller Training Record – Live Helicopter Rappels

If there is a deficiency in one of the areas below, it should be marked unsatisfactory (u) in the appropriate. If no boxes are marked unsatisfactory, place an “x” in the no errors box.

<table>
<thead>
<tr>
<th>Rappel #</th>
<th>Equipment Care</th>
<th>Buddy Check</th>
<th>Spotter Check</th>
<th>Inspect Rigging</th>
<th>Seatbelt</th>
<th>Rappeller Tether</th>
<th>Response to Spotter Signals</th>
<th>Rig Descender</th>
<th>Transition to Skid</th>
<th>Clear Rope</th>
<th>Exit Off Skid</th>
<th>Situational Awareness</th>
<th>Speed Control</th>
<th>Braking</th>
<th>Stop Prior to Landing</th>
<th>Landing</th>
<th>Clear Rappel Site</th>
<th>No Errors *</th>
<th>Comments</th>
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# Annual Certification Rappeller Training Record

| Name: | | |
| Year: | | |
| Crew: | | |
| Training Location: | | |

## Program Overview and Equipment Review

### Classroom Session

<table>
<thead>
<tr>
<th>Station Lead</th>
<th>Pass</th>
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## Buddy Checks

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## Elevated Simulator

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## Mock-Ups

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## Live Helicopter Rappels

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## Final Check Spotter Certification

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<th>Date</th>
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<th>Notes</th>
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### Minimum Requirements

1. Complete two error-free emergency tie-off procedures from suspension

2. Complete minimum of three error-free static line rappels consisting of:
   - One weighted rappel
   - One weighted emergency tie-off procedure (ETO) with knot
   - One weighted re-entry from the skid/step on each side of simulator

   Additional weighted or non-weighted rappels may be utilized until rappeller and/or spotter are comfortable

Penalties will begin to be assessed after first rappel off of elevated simulator

---

### Annual Certification Rappeller Training Record - Elevated Simulator Training

If there is a deficiency in one of the areas below, it should be marked unsatisfactory (u) in the appropriate box. If no boxes are marked unsatisfactory, place an “x” in the no errors box.

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<th>Rappel #</th>
<th>Equipment Care</th>
<th>Buddy Check</th>
<th>Spotter Check</th>
<th>Rappeller Festoon</th>
<th>Rig Descender</th>
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<th>Rappeller Tether</th>
<th>Rappeller Tether</th>
<th>Response to Spotter Signals</th>
<th>Clear Rope</th>
<th>Clear Rope</th>
<th>Remove Rappeller Tether</th>
<th>Rappel Site</th>
<th>Stop Prior to Landing</th>
<th>Clear Rappel Site</th>
<th>Non-weighted Rappel</th>
<th>Weighted Rappel</th>
<th>Weighted Reentry Left Side</th>
<th>Weighted Reentry Right Side</th>
<th>Weighted Knot</th>
<th>Weighted ETO</th>
<th>Suspension ETO</th>
<th>No Errors</th>
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</table>
## Annual Certification Rappeller Training Record - Mock-Ups

If there is a deficiency in one of the areas below, it should be marked unsatisfactory (u) in the appropriate box. If no boxes are marked unsatisfactory, place an “x” in the no errors box.

### Minimum Requirements

1. Perform helicopter mock-up rappels and re-entry procedures as initiated by the spotter, until proficiency is demonstrated from all seating positions

2. An error free re-entry from both sides of the helicopter.

An error free re-entry is counted toward the total number of successful mock-ups

The minimum number could be as little as four successful mock-ups

### Comments

<table>
<thead>
<tr>
<th>Rappel #</th>
<th>Equipment Check</th>
<th>Spotter Check</th>
<th>Inspect Rigging</th>
<th>Seatbelt</th>
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- Error Free Cycle
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  - □ Outside Right
  - □ Outside Left

- Error Free
  - □ Right Side
  - □ Left Side

- Re-entry
  - □ Right Side
  - □ Left Side
# Equipment Care
- Buddy Check
- Spotter Check
- Inspect Rigging
- Seattbelt
- Rappeller Tether
- Response to Spotter Signals
- Rig Descender
- Transition to Skid
- Clear Rope
- Exit Off Skid
- Situational Awareness
- Speed Control
- Braking
- Stop Prior to Landing
- Clear Rappel Site

## Minimum Requirements
- 3 error free live helicopter rappels

### Annual Certification Rappeller Training Record - Live Helicopter Rappels

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<tr>
<th>Rappel #</th>
<th>Equipment Care</th>
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IV. Rappeller Training Record – Mock-Ups

If there is a deficiency in one of the areas below, it should be marked unsatisfactory (u) in the appropriate box. If no boxes are marked unsatisfactory, place an “x” in the no errors box.

**Minimum Requirements**
1. Perform helicopter mock-up rappels and re-entry procedures as initiated by the spotter, until proficiency is demonstrated from all seating positions
2. An error free re-entry is counted toward the total number of successful mock-ups.
   *The minimum number could be as little as four successful mock-ups

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Error Free Cycle Completed
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Error Free Re-Entry
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- □ Left Side

Comments
## V. Rappeller Training Record – Live Rappels

If there is a deficiency in one of the areas below, it should be marked unsatisfactory (u) in the appropriate. If no boxes are marked unsatisfactory, place an “x” in the no errors box.

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Comments
# Annual Certification Spotter Training Record

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## Program Overview and Equipment Review

**Classroom Session**

### Elevated Simulator

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<th>Pass</th>
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### Mock-Ups

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### Live Helicopter Rappels

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## Final Check Spotter's Verification

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<tr>
<th>Check Spotter's Printed Name</th>
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<th>Date</th>
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</table>
If there is a deficiency in one of the areas below, it should be marked **unsatisfactory (u)** in the appropriate box. If no boxes are marked unsatisfactory, place an “x” in the no errors box.

### Minimum Requirements

Complete minimum of three error-free simulations.

<table>
<thead>
<tr>
<th>Spot</th>
<th>Simulator Rigging</th>
<th>Rappeller Equipment Check</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, and Sequence Challenge and Response Verbalization</th>
<th>Emergency Procedures (check if completed)</th>
<th>ETO Sequence</th>
<th>No Errors *</th>
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</tbody>
</table>

Comments
**Annual Certification Spotter Training Record - Mock-Ups**

If there is a deficiency in one of the areas below, it should be marked unsatisfactory (u) in the appropriate box. If no boxes are marked unsatisfactory, place an “x” in the no errors box.

<table>
<thead>
<tr>
<th>Spot</th>
<th>Helicopter 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, and Sequence</th>
<th>Challenge and Response Verbalization</th>
<th>Emergency Procedures (check if completed)</th>
<th>Cargo rigging and deployment</th>
<th>No Errors</th>
</tr>
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<tbody>
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<td>1</td>
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</tbody>
</table>

**Minimum Requirements**

Demonstrate proficiency by completing a minimum of three error-free mock-ups to include:

- Three loads of rappellers
- Correct response to Abort and/or Expedite Emergency Procedures
- One simulation to include initial attack cargo and challenge and response verbalization to the satisfaction of a check spotter
- An error-free re-entry is counted toward the total number of successful mock-ups

**Comments**
# Annual Certification Spotter Training Record - Live Helicopter Rappels

If there is a deficiency in one of the areas below, it should be marked unsatisfactory (u) in the appropriate. If no boxes are marked unsatisfactory, place an “x” in the no errors box.

<table>
<thead>
<tr>
<th>Rappel #</th>
<th>Helicopter Rigging</th>
<th>Rappeller Equipment Check</th>
<th>Seating Arrangement for Rappellers and Spotter</th>
<th>Pre-Lift-Off Procedures</th>
<th>Hand Signals, Exit Procedures, and Sequence</th>
<th>Challenge and Response Verbalization</th>
<th>Communication with Pilot</th>
<th>Emergency Procedures (check if completed)</th>
<th>Cargo rigging and deployment</th>
<th>No Errors</th>
<th>Check Ride Completed</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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</tbody>
</table>

### Minimum Requirements

1. Complete deployment of three loads of rappellers.

2. One successful deployment of rappellers and a full complement of initial attack cargo from helicopter in typical terrain to the satisfaction of a qualified check spotter.

Check ride will be conducted during the first spot.
### III. Spotter Training Record - Mockups

If there is a deficiency in one of the areas below, it should be marked unsatisfactory (u) in the appropriate box. If no boxes are marked unsatisfactory, place an “x” in the no errors box.

<table>
<thead>
<tr>
<th>Spot</th>
<th>Helicopter 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, and Sequence</th>
<th>Communications with Pilot</th>
<th>Emergency Procedures (check if completed)</th>
<th>Cargo rigging and deployment</th>
<th>No Errors *</th>
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</tbody>
</table>

**Minimum Requirements**

1. Demonstrate proficiency deploying Rappellers
2. Demonstrate proficiency deploying cargo
### IV. Spotter Training Record – Live Helicopter Rappels

If there is a deficiency in one of the areas below, it should be marked unsatisfactory (u) in the appropriate. If no boxes are marked unsatisfactory, place an “x” in the no errors box.

<table>
<thead>
<tr>
<th>Minimum Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Complete 3 Spots, one of which will be typical terrain</td>
</tr>
<tr>
<td>2. 1 cargo letdown</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Spot #</th>
<th>Helicopter 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, and Sequence</th>
<th>Communications with Pilot</th>
<th>Emergency Procedures (check if completed)</th>
<th>Cargo rigging and deployment</th>
<th>No Errors *</th>
<th>Check Ride Completed</th>
<th>Comments</th>
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</tbody>
</table>
# Job Aid for the Position of:

**HELICOPTER RAPPEL SPOTTER**  
(HERS)

<table>
<thead>
<tr>
<th>Form C-9</th>
<th>April 2021</th>
</tr>
</thead>
</table>

## Job Aid Assigned To:
- **Trainee’s Name:** ____________________________
- **Home Unit/Agency:** __________________________
- **Home Unit Phone Number:** ____________________

## Job Aid Initiated By:
- **Check Spotter’s Name:** _______________________
- **Home Unit Title:** ____________________________
- **Home Unit/Agency:** __________________________
- **Home Unit Phone Number:** ____________________
- **Home Unit Address:** __________________________
- **Date Initiated:** ____________________________

The material contained in this job aid accurately defines the performance expected of the position for which it was developed. This job aid is approved for use as a position qualification document in accordance with the instructions contained herein.
## Verification/Certification of Completed Job Aid
For the Position of:

### Helicopter Rappel Spotter

<table>
<thead>
<tr>
<th>Final Evaluator’s Verification (Check Spotter)</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>To be completed ONLY when you are recommending the trainee for certification.</em></td>
</tr>
</tbody>
</table>

I verify that (trainee name) ___________________________ has successfully performed as a trainee by demonstrating all tasks for the position listed above and should be considered for certification in this position. All tasks are documented with appropriate initials.

**Final Evaluator’s Signature:**

**Final Evaluator’s Printed Name:**

**Home Unit Title:**

**Home Unit/Agency:**

**Home Unit Phone Number:**

**Date:**

<table>
<thead>
<tr>
<th>Regional Helicopter Operations Specialist (HOS) Review</th>
</tr>
</thead>
</table>

**HOS Signature:**

**HOS Printed Name:**

**Region:**

<table>
<thead>
<tr>
<th>Agency Certification</th>
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</thead>
</table>

I certify that (trainee name) ___________________________ has met all requirements for qualification in the above position and that such qualifications has been issued.

**Certifying Official’s Signature:**

**Certifying Official’s Printed Name:**

**Title:**

**Home Unit/Agency:**

**Home Unit Phone Number:**

**Date:**

**Documentation Review**
All must be completed prior to final evaluator’s verification.

<table>
<thead>
<tr>
<th>Documentation/Task</th>
<th>EVALUATOR: Initial &amp; date upon completion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Complete one season of helicopter rappelling on current equipment.</td>
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<tr>
<td>2. Complete twenty (20) live rappels (4 of which being operational rappels).</td>
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<tr>
<td>3. Qualified as Helicopter Manager (HMGB).</td>
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<tr>
<td>4. Qualified as Incident Commander Type 4 (ICT4).</td>
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<tr>
<td>7. Spot a live split load.</td>
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<tr>
<td>8. Complete four (4) operational spots.</td>
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<tr>
<td>9. Complete spotter trainee assignment with another program.</td>
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<tr>
<td>10. All tasks complete in HERS job aid.</td>
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</tbody>
</table>
I. Instructions for Completing Qualification Records

Each requirement or task for each qualification record shall be signed and dated by the evaluating spotter. In addition to the space provided in this job aid, a spotter evaluation sheet will be completed for any operational spots and cargo deliveries. 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. All training must be supervised by a qualified spotter.

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

- \( T \) = Performed during training, simulator, or mock-up operations
- \( P \) = Performed during training, proficiency, or project operations with helicopter
- \( W \) = Performed 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 shall be evaluated on multiple occasions, by more than one evaluator, and with multiple crews. The number of evaluations of each task is not limited to the number of signature lines provided within the evaluator/date column.

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

A. Prior Spotter Re-Certification

If a spotter has lost their annual certification for a time period of two (2) operational seasons (skipped two seasons of certification), the individual shall complete rappel spotter annual certification requirements (see NROG Chapter 3) and will operate under supervision of a qualified spotter for a time period determined by a check spotter. A check spotter may use past performance and experience as means to determine an acceptable time period.

B. Previous Qualification Expiration

If a previously qualified spotter has not been certified in the three (3) previous operational seasons, the individual will begin spotter training as a new spotter candidate in accordance with the NROG, Chapter 3.

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

C. 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.

D. Annual Certification

Spotter trainees that are operationally spotting need to meet all RT requirement as a rappeller and spotter. Three live spots in typical terrain, first one with a check spotter and qualified thereafter.

E. Helicopter Rappel Spotter

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

F. Re-Evaluation

Any task performed in the Final Evaluation rated as Fail shall require a period of further training followed by a re-evaluation. Tasks 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.
II. Qualification Record Tasks

Tasks one (1) through five (5) will be conducted under the supervision of a qualified helicopter rappel spotter. Elevated simulator and mockups must be completed prior to live spotting of rappellers. All tasks must be completed prior to a check ride, but do not have to be completed in order.

Prior to spotting live loads of rappellers, a spotter trainee must complete a minimum of eight (8) loads from the high tower and twelve (12) mock-ups, both with emergency procedures. The last four (4) mockups need to be done without procedural error. One (1) live ETO from the helicopter in open terrain must be completed before spotting in typical terrain.

Task One: Elevated Simulator

<table>
<thead>
<tr>
<th>TASK</th>
<th>CODE</th>
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<tbody>
<tr>
<td>1. Cabin Configuration</td>
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<td>2. Proper equipment checks</td>
<td>T</td>
</tr>
<tr>
<td>3. Verbalization with pilot/trainer</td>
<td>T</td>
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<tr>
<td>• Correct/appropriate verbiage in sequence</td>
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<tr>
<td>4. Deploy rappellers using proper hand signals/procedures.</td>
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<tr>
<td>5. Emergency procedures</td>
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<tr>
<td>• Proper challenge and response</td>
<td></td>
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<tr>
<td>6. Cargo configuration</td>
<td>T</td>
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<tr>
<td>7. Cargo equipment orientation</td>
<td>T</td>
</tr>
<tr>
<td>8. Cargo equipment checks</td>
<td>T</td>
</tr>
<tr>
<td>9. Rigging and deploying cargo</td>
<td>T</td>
</tr>
<tr>
<td>10. Complete minimum of eight (8) rappel cycles from elevated simulator.</td>
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</tr>
<tr>
<td>• Four (4) without procedural error</td>
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<tr>
<td>• One (1) combined load with cargo</td>
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<tr>
<td>• One (1) load with an emergency tie-off (ETO)</td>
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</tbody>
</table>

Comments:

*Make sure to enter elevated simulator spots to tracking sheet
## Task Two: Mock-up Rappellers and Cargo

<table>
<thead>
<tr>
<th>TASK</th>
<th>CODE</th>
<th>EVALUATOR: Initial &amp; date upon completion of task</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Proper briefing of crew/pilot</td>
<td>T/P</td>
<td></td>
</tr>
<tr>
<td>2. Proper configuration of cargo</td>
<td>T/P</td>
<td></td>
</tr>
<tr>
<td>3. Proper checks on cargo</td>
<td>T/P</td>
<td></td>
</tr>
<tr>
<td>4. Proper rappel configuration</td>
<td>T/P</td>
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</tr>
<tr>
<td>5. Re-configure helicopter for multiple sticks of rappellers</td>
<td>T/P</td>
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<tr>
<td>• Split load</td>
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<tr>
<td>6. Proper verbalization</td>
<td>T/P</td>
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<tr>
<td>7. Proper hand signals</td>
<td>T/P</td>
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<tr>
<td>8. Emergency procedures</td>
<td>T/P</td>
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<tr>
<td>• Proper challenge and response</td>
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<td>◆ Expedite vs. Abort</td>
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<tr>
<td>• Minimum of four (4) without procedural error</td>
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<tr>
<td>9. Complete minimum of twelve (12) mock-ups</td>
<td>T/P</td>
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<tr>
<td>• Last four (4) without procedural error</td>
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<tr>
<td>• Minimum of two (2) loads with cargo</td>
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</table>

**Comments:**

*Make sure to enter mock-up spots to tracking sheet*
Task Three: Live Spotting of Cargo

*The items in task three can be completed concurrently with the items in task four*

<table>
<thead>
<tr>
<th>TASK</th>
<th>CODE</th>
<th>EVALUATOR: Initial &amp; date upon completion of task</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Proper briefing of crew/pilot</td>
<td>P/W</td>
<td></td>
</tr>
<tr>
<td>2. Proper configuration of cargo</td>
<td>P/W</td>
<td></td>
</tr>
<tr>
<td>3. Proper equipment checks</td>
<td>P/W</td>
<td></td>
</tr>
<tr>
<td>4. Proper verbalization</td>
<td>P/W</td>
<td></td>
</tr>
<tr>
<td>5. Ensure OGE power check is completed</td>
<td>P/W</td>
<td></td>
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<tr>
<td>6. Select adequate cargo site</td>
<td>P/W</td>
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<tr>
<td>7. Maintain helicopter and rotor clearance throughout cargo letdown sequence</td>
<td>P/W</td>
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<tr>
<td>8. Maintain visual on cargo</td>
<td>P/W</td>
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<tr>
<td>9. Maintain focus and control of mission</td>
<td>P/W</td>
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<tr>
<td>10. Complete a minimum of eight (8) cycles of live cargo</td>
<td>P/W</td>
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<tr>
<td>- Complete at low, medium, and high heights</td>
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<tr>
<td>- Complete a minimum of four (4) in typical terrain</td>
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<tr>
<td>- Complete a minimum of four (4) without procedural error</td>
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</tbody>
</table>

Comments:

*Make sure to enter live cargo spots to tracking sheet*
Task Four: Live Spotting of Rappellers
*Prior to operational spotting, trainee must receive concurrence from base manager and a check spotter
*All tasks in task four must be completed prior to a check ride
*The items in task four can be completed concurrently with items in task three.

<table>
<thead>
<tr>
<th>TASK</th>
<th>CODE</th>
<th>EVALUATOR: Initial &amp; date upon completion of task</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Proper briefing of crew/pilot</td>
<td>P/W</td>
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<tr>
<td>2. Proper configuration</td>
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<td>3. Proper equipment checks</td>
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<td>4. Proper verbalization</td>
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<tr>
<td>5. Ensure OGE power check is completed</td>
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<td>6. Proper hand signals</td>
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<tr>
<td>7. Select adequate rappel and emergency site</td>
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<tr>
<td>8. Maintain helicopter and rotor clearance throughout rappel/cargo sequence</td>
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<td>9. Maintain visual on ropes, rappellers, and on cargo</td>
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<tr>
<td>10. Reconfigure helicopter in flight between deliveries of multiple sticks of rappellers</td>
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<tr>
<td>▪ Split load</td>
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<tr>
<td>11. Perform live ETO prior to spotting in typical terrain</td>
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<tr>
<td>12. Maintain focus and control of mission</td>
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<tr>
<td>13. Complete a minimum of twenty (20) live spots</td>
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<tr>
<td>▪ Complete a minimum of ten (10) spots without procedural error</td>
<td>P/W</td>
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<tr>
<td>▪ Complete a minimum of fifteen (15) spots in typical terrain</td>
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<tr>
<td>▪ Complete a minimum of six (6) spots with cargo</td>
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<tr>
<td>▪ Complete a minimum of four (4) operational spots</td>
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</tbody>
</table>

Comments:

*Make sure to enter live spots to tracking sheet
Task Five: Communications, Size-up, Risk Management

<table>
<thead>
<tr>
<th>TASK</th>
<th>CODE</th>
<th>EVALUATOR: Initial &amp; date upon completion of task</th>
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</thead>
<tbody>
<tr>
<td>1. Flight follow with appropriate authorities</td>
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<tr>
<td>2. Maintain flight navigation</td>
<td>W</td>
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<tr>
<td>3. Establish communications and coordinate with initial attack resources</td>
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<td>4. Identify flight hazards</td>
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<tr>
<td>5. Provide fire size-up to appropriate authority</td>
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<td>6. Identify escape routes and safety zones</td>
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<tr>
<td>7. Identify rappel and emergency sites or helispot</td>
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<tr>
<td>8. Assess helicopter performance capabilities</td>
<td>W</td>
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</tbody>
</table>
| 9. Establish communications with rappellers on the ground:  
  ▪ Provide further LCES/fire information  
  ▪ Confirm rappellers have communication with dispatch and/or proper authority | W | |

Comments:

Once spotter trainee has completed tasks 1-5, demonstrating understanding and competence in all aspects of elevated simulator, mock-up, cargo delivery, emergency procedures and rappeller delivery, the base manager may contact a check spotter for a final check ride.
III. Task Recording Sheets

<table>
<thead>
<tr>
<th>Task One Elevated Simulator</th>
<th>Cargo</th>
<th>Rappellers</th>
<th>Emergency Procedures</th>
<th>Without Error</th>
<th>Evaluator</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Complete minimum of 8 rappel cycles. *Four rappel cycles must be without procedural error. *One combined load with cargo. *One load with ETO.</td>
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</table>

Comments:
## Task Two Mock-ups


<table>
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<th>Emergency Procedures</th>
<th>Without Error</th>
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Comments:
**Task Three**  
**Live Cargo**


*(Items in task three can be completed concurrently with the items in task four)*

<table>
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<th>Vegetation</th>
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Comments:
**Task Four**

**Live Spotting Rappellers**

*Complete a minimum of 4 operational spots prior to check ride.

_Items in task four can be completed concurrently with items in task three_

<table>
<thead>
<tr>
<th>Vegetation</th>
<th>Height</th>
<th>Cargo</th>
<th>Rappellers Without Error</th>
<th>Evaluator</th>
<th>Date</th>
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</table>
Helicopter Rappel Spotter (HERS)

<table>
<thead>
<tr>
<th>Task Four</th>
<th>Live Spotting Rappellers</th>
</tr>
</thead>
</table>

*Items in task four can be completed concurrently with items in task three*

<table>
<thead>
<tr>
<th>Vegetation</th>
<th>Height</th>
<th>Cargo</th>
<th>Rappellers Without Error</th>
<th>Evaluator</th>
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IV. Final Evaluation (Demonstrated Competency and Check Ride)

After performing all required tasks in the job aid under supervision and completion of additional qualifications, a final evaluation including demonstrated competency and check ride will be requested by the base manager.

A trainee shall receive their final evaluation from a check spotter from another base.

Demonstrated competency and check ride may occur during proficiency or training rappels, incident operations, or a combination of both at the discretion of the evaluating check spotter.

The final evaluation will include:

- Three (3) procedurally correct loads of mock-up cycles with emergency procedures and cargo.
- Three (3) procedurally correct live loads of rappellers and cargo in typical terrain.

A fail rating on any task may end the evaluation at any point at the discretion of the check spotter. Re-evaluation by a check spotter may occur at a later date once the spotter trainee has received corrective training from a qualified rappel spotter. Subsequent evaluations will include demonstrated competency and check ride.
Final Evaluation: Demonstrated Competency – Helicopter Mock-ups
To obtain a comprehensive assessment of the trainee’s knowledge, skills, and abilities in dynamic environment, a check spotter may utilize any combination of the following inputs during the demonstrated competency for mockups. Inputs will not be utilized during live rappels. When inputs are utilized, the pass/fail rating may be assessed with consideration to the trainee’s adaptability or response to the input.

- **REQUIRED** Expedite EPs to include re-entries, rappeller(s) on rope, or cargo.
- **REQUIRED** Abort EPs to include re-entries and rappeller(s) on rope, or cargo.
- **REQUIRED** Rappeller or rappel equipment mis-rigging (change blindness).
- **RECOMMENDED** Loss of communication with pilot.
- **RECOMMENDED** Incorrect challenge/response from pilot.

<table>
<thead>
<tr>
<th>TASK</th>
<th>Load 1</th>
<th>Load 2</th>
<th>Load 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Brief pilot and rappellers in helicopter mock-up operations.</td>
<td>Pass</td>
<td>Fail</td>
<td>Pass</td>
</tr>
<tr>
<td>2. Properly configure helicopter (per requirements) with rappel and cargo equipment.</td>
<td>Pass</td>
<td>Fail</td>
<td>Pass</td>
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<tr>
<td>3. Demonstrate proper spotting techniques and sequence including equipment checks, hand signals, and verbiage with pilot without procedural error. (Communication with pilot must be clear, effective, and concise).</td>
<td>Pass</td>
<td>Fail</td>
<td>Pass</td>
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<tr>
<td>4. Exhibit comprehensive knowledge of possible emergency situations and demonstrate appropriate response and action to emergency procedures.</td>
<td>Pass</td>
<td>Fail</td>
<td>Pass</td>
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<tr>
<td>5. Exhibit proper cargo deployment techniques and proficiency from grounded helicopter using proper verbiage with pilot.</td>
<td>Pass</td>
<td>Fail</td>
<td>Pass</td>
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<tr>
<td>6. Demonstrate command of all aspects of the rappel and cargo operation, making prompt decisions and giving appropriate directions as needed.</td>
<td>Pass</td>
<td>Fail</td>
<td>Pass</td>
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<tr>
<td>7. Provide adequate and accurate feedback to rappeller(s) and pilot post mock-up sequence.</td>
<td>Pass</td>
<td>Fail</td>
<td>Pass</td>
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</tbody>
</table>

100% competency for the minimum number of demonstrated mock-ups.

Three (3) procedurally correct loads of mock-up cycles with emergency procedures and cargo.

YES | NO

Check Spotter Signature and Date:
Final Evaluation: Helicopter Rappel Spotting (Check Ride)

Final Evaluation instruction(s) to Check Spotter
Check ride will be performed in typical terrain and include cargo. 100% competency must be achieved in all elements of the evaluation.

<table>
<thead>
<tr>
<th>TASK</th>
<th>Load 1</th>
<th>Load 2</th>
<th>Load 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Perform pre-flight risk assessment and mitigation to include manifests, load calculation, weather, fuel quantity, flight hazards and communications.</td>
<td>Pass</td>
<td>Fail</td>
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<tr>
<td>2. Conduct comprehensive and appropriate pre-flight briefing with crew and pilot to review operations, risk management and communications.</td>
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<td>3. Properly configure helicopter, per requirements, with rappel and cargo equipment.</td>
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<td>4. Demonstrate ability to operate radios and effectively communicate with dispatch or appropriate flight following authority and with ground/air resources (if present.)</td>
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<td>5. Perform proper high and low-level reconnaissance of rappel area. Assure helicopter capabilities and limitations under given altitude, temperature, weather condition and payload.</td>
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<td>6. Identify emergency site considering landing site conditions, distance from incident, fire behavior, and hazards</td>
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<td>7. Select primary and emergency rappel sites considering terrain, obstacles, winds, fire behavior and hazards.</td>
<td></td>
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</tr>
<tr>
<td>8. Demonstrate proper spotting techniques and sequence including equipment checks, hand signals, and verbiage with pilot, without procedural error. Communication with pilot must be clear and concise.</td>
<td></td>
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</tr>
<tr>
<td>9. Demonstrate proper cargo configuration and deployment procedures.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>10. During rappel and cargo deployment, keep pilot/helicopter over rappel site with minimal movement.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>11. Demonstrate command of all aspects of the rappel and cargo operation, making prompt decisions and giving appropriate directions as needed.</td>
<td></td>
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</tr>
<tr>
<td>12. Conduct post-rappel debriefing with crew and pilot emphasizing planned events, actual events, and events that need to be reinforce or improved.</td>
<td></td>
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</tr>
</tbody>
</table>
Final Evaluation: Helicopter Rappel Spotting (Check Ride)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>YES</strong></td>
<td>Spotter trainee has met all requirements and performed all aspects of the evaluation to the satisfaction of the evaluating check spotter. Spotter trainee is recommended for full certification.</td>
</tr>
<tr>
<td><strong>NO</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Check Spotter Signature and Date:**

**Notes and Comments:**
# Helicopter Rappel Spotter Mission Evaluation

<table>
<thead>
<tr>
<th>Name:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trainee:</td>
<td>Y N</td>
</tr>
<tr>
<td>Incident Name:</td>
<td></td>
</tr>
<tr>
<td>Incident Location:</td>
<td></td>
</tr>
<tr>
<td>Tail #:</td>
<td>Pilot Name:</td>
</tr>
<tr>
<td>Incident Complexity Type:</td>
<td>1 2 3 4 5 IA PROF Annual Certification Medical Other:</td>
</tr>
<tr>
<td>Airspace Complexity Elements:</td>
<td>TFR MOA/SUA ATC</td>
</tr>
<tr>
<td>Other Aircraft:</td>
<td>Helicopters Jump Planes Air Tankers SEATs ATGS Other:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Evaluation Elements (see below)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>N/A</th>
<th>Remarks</th>
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<tbody>
<tr>
<td>Spatter Pre-flight</td>
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<tr>
<td>Mission Briefing</td>
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<tr>
<td>Rappeller Loading</td>
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<tr>
<td>EnRoute Procedures</td>
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<tr>
<td>Frequency Management</td>
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<tr>
<td>OGE Power Check completed</td>
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<tr>
<td>Primary/Emergency Site Selection</td>
<td></td>
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<tr>
<td>Maintain Clearance of Aircraft</td>
<td></td>
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<tr>
<td>Appropriate Verbalization Through Sequence</td>
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<tr>
<td>Appropriate Hand Signals</td>
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<tr>
<td>Maintain Visual on Ropes, Rappellers and Cargo, Appropriate Adjustments Made As Needed</td>
<td></td>
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<tr>
<td>Inflight Re-rigging of Rappel Equipment</td>
<td></td>
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</tr>
<tr>
<td>Maintain Focus and Control of Mission</td>
<td></td>
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<tr>
<td>Mission Planning</td>
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<td>FTA Control</td>
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<tr>
<td>Provide Fire Information/Sizeup</td>
<td></td>
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<tr>
<td>LCES Established for Rappellers</td>
<td></td>
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<tr>
<td>CRM with Rappellers</td>
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<tr>
<td>CRM with Pilot</td>
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<tr>
<td>CRM with Chase Crew</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Evaluation Elements</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>No assistance required or deficiency noted.</td>
<td></td>
<td></td>
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<tr>
<td>Minor</td>
<td>Non-critical deviations are noted, but the outcome of the event/objective was never in doubt.</td>
<td></td>
<td></td>
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<tr>
<td>Moderate</td>
<td>Coaching was required and the outcome of the event/objective was in doubt.</td>
<td></td>
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</tr>
<tr>
<td>Significant</td>
<td>Frequent coaching was required. The outcome of the event was in doubt and safety was compromised.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>NA</td>
<td>Task/procedure was not applicable to this mission.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Focus areas for next mission:

Qualified Spotter:
Form C-10 – Rappel Program Proposal Form

FROM:

TO:

RE:

KEY POINTS:

RTS Comments: □ Support □ Do Not Support

ROS Comments: □ Support □ Do Not Support

PROGRAM PRIORITY LEVEL
□ High (Rappel program will shut down if not acted on)
□ Medium (Could affect rappel operation in the near future)
□ Low (It would benefit the rappel program)

NRWT: □ Approved □ Denied □ Need Additional Information
Tracking Number:
NRWT Comments and NROG Reference:

/s/
National Rappel Specialist – NRWT Chair
Form C-11 – Rappel Tower Annual Condition Assessment Checklist

(To be completed by the base manager or designee)

Tower Location: 

Date of Inspection: 

Inspected By: 

<table>
<thead>
<tr>
<th>Tower and Simulator - Overall Condition</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>Yes</td>
<td>No</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>Yes</td>
<td>No</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>Yes</td>
<td>No</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>Yes</td>
<td>No</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>Yes</td>
<td>No</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>Yes</td>
<td>No</td>
<td>The warning light system must function at all times and the tower may not be used when it is not functional.</td>
</tr>
<tr>
<td>Question</td>
<td>Yes</td>
<td>No</td>
<td>Remarks</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
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<td>----------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Are all faying surfaces at all connections in firm contact?</td>
<td></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 gratings properly installed with adequate attachment to</td>
<td></td>
<td></td>
<td>Any lose grating must be secured to the supporting framework before the tower can be used.</td>
</tr>
<tr>
<td>supporting framework?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are all anchor rods and bolts snug and tightened to 200 ft.-lbs. torque?</td>
<td></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 at least one full thread for all bolts and anchor rods projected</td>
<td></td>
<td></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>
</tr>
<tr>
<td>beyond the face of the nut?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are “X” bracing rods installed under tension with no detectable sag?</td>
<td></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 tower plumb and free from twisting or racking?</td>
<td></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 all members in good repair, checked for missing, cracked or broken</td>
<td></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>parts?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do all gates have properly working closing mechanisms and latches?</td>
<td></td>
<td></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>Are all handrails present to provide fall protection?</td>
<td></td>
<td></td>
<td>Any missing parts will have to be replaced before the tower can be used.</td>
</tr>
<tr>
<td>Have all the anchor points for rappellers and spotters been removed</td>
<td></td>
<td></td>
<td>This can be done by tapping on the bolts with a carabineer and if they are loose, they will rattle. Or check it with a torque wrench.</td>
</tr>
<tr>
<td>and NDT’d or replaced and been installed per manufacturer’s</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>recommendations?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Has all damaged paint been repaired?</td>
<td></td>
<td></td>
<td>Damaged paint should be repaired as soon as possible to help increase longevity of the tower.</td>
</tr>
<tr>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
## Simulator

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are all faying surfaces at all connections in firm contact?</td>
<td></td>
<td></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>
</tr>
<tr>
<td>Are all gratings properly fastened to supporting framework?</td>
<td></td>
<td></td>
<td>Any lose grating must be secured to the supporting framework before the tower/simulator can be used.</td>
</tr>
<tr>
<td>Are all members square, true and plum?</td>
<td></td>
<td></td>
<td>If members are not square and plum for the simulator, it should not be used and engineering should be contacted immediately.</td>
</tr>
<tr>
<td>Do all gates and doors work properly and have properly working closing mechanisms and latches?</td>
<td></td>
<td></td>
<td>The doors must slide easily, latch and provide safety when closed.</td>
</tr>
<tr>
<td>Have all weep holes been cleaned out?</td>
<td></td>
<td></td>
<td>Weep holes need to be open to allow any moisture that gets into the HSS to drip out.</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</td>
<td></td>
<td></td>
<td>This can be done by tapping on the bolts with a carabineer and if they are loose, they will rattle. Or check it with a torque wrench.</td>
</tr>
<tr>
<td>Have all long and short plates, skid and J step been inspected?</td>
<td></td>
<td></td>
<td>All plates must be checked each year before the tower/simulator can be used.</td>
</tr>
<tr>
<td>Has all damaged paint been repaired?</td>
<td></td>
<td></td>
<td>Damaged paint should be repaired as soon as possible to help increase longevity of the simulator.</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.
Form C-12 – Rappel Tower Daily Pre-Use Condition Assessment Checklist
(To be completed by Base Manager or Designee)

Tower Location: ________________________________

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 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 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></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></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>Have the tower and simulator been assessed for rough edges, burrs or other 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 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 tower can be used.</td>
</tr>
<tr>
<td>Has the landing area been loosened up prior to use?</td>
<td></td>
<td></td>
<td>No rappelling will be allowed if the rappel landing area is too hard and may cause knee and ankle.</td>
</tr>
<tr>
<td>Is lightning protection system intact and functional?</td>
<td></td>
<td></td>
<td>Lightning protection system must be functional before the tower can be used. THE TOWER CANNOT BE USED DURING ANY KIND OF STORM.</td>
</tr>
</tbody>
</table>

THE TOWER CANNOT BE USED DURING ANY KIND OF STORM.
<table>
<thead>
<tr>
<th>Conditions</th>
<th>Yes</th>
<th>No</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is the aircraft warning light system working?</td>
<td></td>
<td></td>
<td>The warning light system must function at all times and the tower may be not used when it is not functional.</td>
</tr>
<tr>
<td>Are stairs, walkways and landings clear of snow, ice and debris and in good condition?</td>
<td></td>
<td></td>
<td>All snow, ice and debris must be removed before any training is allowed on the tower.</td>
</tr>
<tr>
<td>Are all landings and tower decks free of trip/slip hazards (e.g., water, protruding bolts)?</td>
<td></td>
<td></td>
<td>All hazards will have to be removed or mitigated before the tower can be used.</td>
</tr>
<tr>
<td>Is the railing system complete and in good condition?</td>
<td></td>
<td></td>
<td>Any missing parts will have to be replaced before the tower can be used.</td>
</tr>
<tr>
<td>Are toe boards installed in all areas where personnel could pass underneath?</td>
<td></td>
<td></td>
<td>Any missing parts will have to be replaced before the tower can be used.</td>
</tr>
<tr>
<td>Are all areas that pose a tripping or head hazard marked in yellow?</td>
<td></td>
<td></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>Are the access control gates and latches present, functional and in good working condition?</td>
<td></td>
<td></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>Have the rope anchors been checked for distortion and tightness of bolts?</td>
<td></td>
<td></td>
<td>This can be done by tapping on the bolts with a carabineer and if the bolts are loose, they will rattle or it can be checked with a torque wrench.</td>
</tr>
<tr>
<td>Have all required anchors for rappellers and spotters been installed?</td>
<td></td>
<td></td>
<td>The lower platform should be setup before rappellers are allowed on the lower platform.</td>
</tr>
<tr>
<td>Is the tower plumb and free from twisting or racking?</td>
<td></td>
<td></td>
<td>If the tower is leaning or twisted, it should not be used and engineering should be contacted immediately.</td>
</tr>
<tr>
<td>Are all members in good repair - check for missing, cracked or broken parts?</td>
<td></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 all gratings properly attached to supporting</td>
<td></td>
<td></td>
<td>Any lose grating must be secured to the supporting framework before the tower can be used.</td>
</tr>
<tr>
<td>Has 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></td>
<td></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>
<tr>
<td>Is the simulator clear of snow, ice and debris and in good condition?</td>
<td></td>
<td></td>
<td>All snow, ice and debris should be removed before any training is allowed on the tower.</td>
</tr>
<tr>
<td>Conditions</td>
<td>Yes</td>
<td>No</td>
<td>Remarks</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------</td>
<td>-----</td>
<td>----------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Is the railing system complete and in good condition?</td>
<td></td>
<td></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></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 the access control gates and latches present, functional and in good working condition?</td>
<td></td>
<td></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></td>
<td></td>
<td>This can be done by tapping on the bolts with a carabineer and if they are loose, they will rattle. Or check it 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></td>
<td></td>
<td>The doors must slide easily, latch and provide safety when closed.</td>
</tr>
<tr>
<td>Have all required anchors for rappellers and spotters been installed?</td>
<td></td>
<td></td>
<td>The simulator should be setup before rappellers are allowed in the simulator.</td>
</tr>
<tr>
<td>Have the long and short plates, skid and J-step been inspected for signs of distortion?</td>
<td></td>
<td></td>
<td>The plates may not be used if they show and signs of distress until they have been inspected by a qualified engineer.</td>
</tr>
<tr>
<td>Other Items Noted:</td>
<td></td>
<td></td>
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</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.
Appendix D – Equipment and Procedures Development and Evaluation Responsibilities

I. New Equipment and Procedures Proposal Process

The Rappel Training Subcommittee (RTS) evaluates new proposals for helicopter rappel equipment and procedures, and makes the initial recommendation to the National Rappel Working Team (NRWT) as to whether a given proposal merits a formal evaluation.

New proposals for improved helicopter rappel equipment or procedures may come from field users and should be passed to the RTS through the individual’s Rappel Operations Subcommittee (ROS) representative. If a proposal is judged by the RTS to be worthy of a formal evaluation, the RTS chairperson will notify the NRWT chairperson and submit a formal proposal. The NRWT shall then consider the proposal based upon the RTS’s recommendations. If the NRWT concurs with the RTS recommendation, the NRWT chairperson will contact the appropriate technical specialist to develop a plan for a technical evaluation of the proposed equipment or procedure. In the case of new equipment, the National Technology and Development Program (NTDP) rappel equipment specialist is the primary point-of-contact for development and evaluation.

New proposals for equipment or procedures shall be documented using Form C-10, Equipment and Procedure Proposal Form, found in Appendix C. Based on the significance of the changes, revision of the NROG may be warranted.

II. Development and Evaluation Process Responsibilities

A. National Rappel Working Team

The NRWT is responsible for oversight, direction and approval of all Forest Service helicopter rappel and cargo letdown equipment, procedures, training and operations.

To ensure that the NRWT decisions on helicopter rappel equipment, cargo letdown equipment, or procedures reflect applicable technical and safety standards, the rappel equipment specialist from NTDP may be invited as needed to participate in any NRWT meetings, conference calls, and communications as a non-voting member and technical advisor. To ensure that the NRWT gives sufficient consideration to operational issues related to proposed helicopter rappel equipment and procedures, it may be necessary to involve the ROS as an advisory group.
B. Rappel Training Subcommittee (RTS)

The primary responsibility of the RTS is to provide the NRWT with sound and timely advice on all issues related to helicopter rappel equipment and procedures.

To ensure that the RTS recommendations for revisions to helicopter rappel equipment and or procedures reflects applicable technical and safety standards, the NTDP rappel equipment specialist may participate as needed in RTS meetings, conference calls, and communications as a technical advisor.

The RTS is authorized by the NRWT to perform evaluations of any issue related to helicopter rappel equipment and procedures as long as the evaluation does not require personnel to be exposed to helicopter-related hazards or fall hazards.

The RTS will assign one member to lead each evaluation and report the results in writing back to the other RTS members. In some cases, the NTDP rappel equipment specialist may be assigned to lead such evaluations. The RTS chairperson is responsible for reporting the results of each evaluation to the chairperson of the NRWT. After receiving such input from the RTS, the NRWT chairperson is responsible for disseminating the information to other NRWT members for review and for tracking the progress of the proposed change. The NRWT is responsible for making the final determination on any issue that might result in an alteration of current helicopter rappel equipment and procedures. When an evaluation cannot be accomplished without exposing personnel to helicopter related or fall hazards, the RTS must be specifically and formally authorized to perform the evaluation by the NRWT. The authorization for conducting potentially hazardous evaluations will be in the form of a formal electronic letter under the NRWT letterhead sent from the NRWT chairperson to the RTS chairperson. Once an authorization for conducting a potentially hazardous evaluation is received, the RTS chairperson will convene a meeting or conference call with all RTS members to determine who will be responsible for leading and conducting the evaluation, and to develop an action plan and schedule. In addition to the other responsibilities as outlined above, the person assigned to lead the evaluation will develop a Job Hazard Analysis.

C. Technical Specialists

Equipment and procedure development or evaluations generally rely upon collaboration with a number of specialists who have technical expertise related to the concern or initiative. Technical specialists include, but are not limited to, the NTDP rappel equipment specialist, national aeronautical engineer, national helicopter inspector pilot/program manager, and national aviation maintenance inspector.
Because NTDP has a designated role in the USDA Forest Service Washington Office Engineering Program to evaluate, design and test equipment used in Forest Service Fire and Aviation operations, the NTDP rappel equipment specialist will often be the primary technical specialist and lead on most Forest Service helicopter rappel equipment endeavors.

The chairperson of the NRWT is responsible for keeping the NTDP rappel project leader or appropriate technical specialist(s) informed on issues related to rappel equipment and procedures, and for negotiating the assignment of new tasks that may impact the technical specialist’s program of work.

When the NRWT identifies a need for new or improved helicopter rappel equipment, the chairperson of the NRWT will notify the NTDP rappel equipment specialist or appropriate technical specialist. Upon receiving said notification, the rappel equipment specialist or other technical specialist(s) and NRWT chairperson will jointly develop a formal tasking that includes a statement of work and projected timeline for completion. Once details of the tasking have been agreed upon, the NRWT chairperson will issue a formal tasking via a letter under NRWT letterhead.

D. **Workload Prioritization**

The urgency and complexity of the requested task will dictate whether the task may be simply added to the technical specialist’s existing work list or if the task will require a re-prioritization of the existing program of work. If an urgent need to accomplish a given task delays the accomplishment of other tasks in the program of work, the projected timelines on delayed tasks must be adjusted accordingly. The NRWT will collaborate with the technical specialist in re-prioritizing workloads.

If the funds required to accomplish specialty tasks are above what has been allotted to in the rappel budget, the technical specialist will present the estimate to the NRWT chairperson. It then becomes the NRWT chairperson’s responsibility to procure funding for the specialty project.
Appendix E – Rappel Equipment Irregularity Reporting Protocols

1. If a piece of equipment used in rappel or cargo letdown operations presents a potential safety issue or is suspected to have contributed to a rappel accident or incident with potential, the equipment shall be immediately sequestered and removed from service.

2. The individual who identifies the issue will inform his/her base manager (ROS member) and complete a SAFERAP as soon as possible. If the incident or observation has the potential to cause harm to other individuals, the ROS member shall immediately notify the national rappel specialist (NRWT chairperson) and NTDP rappel equipment specialist.

3. The NRWT will make an assessment about the nature of the problem and determine whether it might pose an immediate or potential safety hazard. The NRWT is responsible for notifying all agency rappel users of known or suspected problems involving rappel or cargo letdown equipment.

4. The NRWT chairperson shall notify other agencies also conducting rappel operations of the issue or incident.

5. NRWT members shall notify their respective regional aviation safety manager.

6. Any rappel equipment item that has been identified as anomalous, of questionable condition, or has contributed to an accident or incident will be sent to the NTDP rappel equipment specialist for examination and testing as soon as possible. In such cases, the rappel equipment specialist will perform a technical evaluation and report back to the NRWT chairperson as soon as practical.

7. Based upon the findings of the equipment testing, the NRWT, with collaboration from the ROS, RTS, and NTDP rappel equipment specialist, shall communicate those findings to the field units along with recommendations or direction.
Appendix F – Specified Equipment Attachment Standards

I. Equipment Attachment Methods

A. Attaching BD Bag Click Lock Buckle Adapter to Rappel Harness

1. Position buckle adaptor (MTDC-1023) over harness between webbing bridge and leg buckle (FIGURE F-1). Ensure adapter buckle is correctly oriented.

2. Route adapter buckle through webbing loop (FIGURE F-2).

3. Complete installation by dressing webbing as shown (FIGURE F-3).

4. Tacking or other fasteners are not needed to keep the buckle in the correct location.
B. Attaching Click Lock Buckles to BD Bag

1. Place a mark on both BD bag compression straps, 6 ½” below the top of the main back panel (Figure F-4).

   ![Figure F-4](image)

2. Fold 4 ½” webbing strap (provided) to create a ½” overlap. Then fold overlapped webbing under to cover cut edge (FIGURE F-5). Grasp with forceps. Note orientation of click lock buckle.

   ![Figure F-5](image)
3. Align the folded webbing with the reference mark made in step 1, then oriented the buckle facing the top of the BD bag with the \( \frac{1}{2} \)" fold (from step 2) against the compression strap. Place three bar tacks \( \frac{3}{4} \)" apart beginning 1/8" from the folded edge as shown in FIGURE F-6.

1. Repeat the process for the other side. Check connection with rappel harness to ensure proper buckle orientation.
C. Attaching Rappel Spotter Extendable Tether (NTDP-1132) to Miller Revolution Harness

1. Insert the free end of tether through the adjuster as shown. Pass end of tether through underside of harness ring (FIGURE F-7).

2. Pass tether end through harness D ring and back through adjuster (FIGURE F-8)

3. Adjust for the proper tether length, then fold the free end back over the bottom bar of adjuster and under top bar of adjuster. Secure the loose end utilizing the techniques on the following page:
a. Using nylon super tack cord and a large gauge needle, pass needle down through locking tab and the outer webbing of the adjustment loop, than back up through both webbing layers (FIGURE F-9 and F-10).

i. Bring the double ends of super tack cord together and tie a surgeon’s knot in the center. Trim the ends leaving about ½” tails (FIGURE F-11).
b. **OR Secure the loose end tab to the webbing with a ¼” bar tack located 1” from the adjuster (FIGURE F-12)**

![Figure F-12](image-url)
D. **Rappeller Knife and Sheath Installation**

1. Route rappeller knife tether through knife handle and mark tether at 4” and 6” from the free end (FIGURE F-13).

![Figure F-13](image)

2. Route Fid as shown, entering and exiting the cord at the marks created in step 1 (FIGURE F-14).

![Figure F-14](image)
3. Pull cord with fid to create fingertrap (FIGURE F-15). Place a ¾” bar tack (or straight stitch) in cord to create a 1” loop around knife handle (Figure F-16)

Figure F-15

Figure F-16
4. The rappeller version of the knife sheath comes with one end of the “belt loop” already attached. It is acceptable to use either a standard industrial type sewing machine or a bar tack machine to complete this attachment. Locate the installation location on rappel harness on the left side between the leg strap pad and leg strap connecting buckle (Figure F-17)

![Figure F-17](image)

5. Place the 1” webbing “belt loop” over the 1 ¾” harness webbing and sew 1” webbing belt loop to the back side of the sheath above the top of lanyard pouch **DO NOT SEW TO HARNESS WEBBING.** (FIGURE F-18)

![Figure F-18](image)
6. Locate the knife as close to the leg buckle as possible and secure in place using super tack cord. Pass the needle through the knife sheath and harness leg webbing then back through about ¼” apart (FIGURE F-19). Complete the tacking by tying a surgeon’s knot and trimming the tails to about ½” (FIGURE F-20).

7. Complete the installation by stowing the lanyard in the lanyard pocket with the knife properly oriented and securing the snaps.
E. **Spotter Knife and Sheath Attachment**

1. Attach the knife to the sheath by routing the lanyard as shown in FIGURE F-21 and placing 2 bar tacks or lock stitches (1/2” long), attaching the lanyard cord to the knife and sheath closure tab. Note the knife orientation (FIGURE F-21).

![Figure F-21](image)

2. Locate spotter knife installation location on left shoulder strap of spotter harness. Handle should face downward. (FIGURE F-22)

![Figure F-22](image)
3. Place ¾” bar tacks (or lock stitch) at each webbing loop to complete “belt loop” attachments (FIGURE F-23). **Do not sew through harness webbing.**

![Figure F-23](image)

4. It may be necessary to tack the knife sheath to the harness shoulder strap. After adjusting the harness for proper fit, use nylon super tack and a large needle to tack the sheath to the harness. Pass the needle through both the sheath and harness webbing, then back through about ¼” apart. Finish the installation by tying a surgeon’s knot. Remove the lanyard cord prior to tacking, to ensure it is not tacked in place (FIGURE F-24 and F-25).

![Figure F-24](image) ![Figure F-25](image)
F. Emergency knife blade replacement

1. Use a philips screwdriver to remove the 5 screws. It is not necessary to remove the lanyard/webbing when changing blades.

2. Separate the two halves and remove old blades. Note the rectangular blade locator indentations on the inside of each half of the knife frame (Figure F-26).

3. The Raptor blades have a bevel on one side. The blades must be placed correctly in the locator indentations, with the beveled side overlapping in the center (FIGURE F-27).
4. Replace the blade in the bottom section first. Place the new blade beveled side down, cutting edge facing the center of hook, in the locator indentation (FIGURE F-28).

5. Carefully lift upper half, place new blade in locator indentation on upper half, beveled side up, cutting edge toward center of hook. Temporarily hold blade in place with thumb (FIGURE F-29).
6. Continue holding upper blade in place with thumb, move both knife ends to table edge. Carefully clamp the two halves together as shown. The upper blade will be temporarily held in place between the two frame halves (FIGURE F-30).

![Figure F-30]

7. Align the two knife halves, ensuring that the upper blade remains in correct position by maintaining slight downward pressure on the upper frame half (FIGURE F-31).

![Figure F-31]
8. Hold frame halves together until screws have been inserted and tightened. Recheck blades to ensure correct placement (FIGURE F-32).
Appendix G – GAR Rappel Risk Assessment

I. GAR (Green-Amber-Red) Model

The GAR model allows for time-critical risk assessment and generates communication concerning mission risks. This communication 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 differences 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 missions as appropriate. All helicopter program managers should receive training on the GAR model and its use. Helicopter program managers will 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 Appendix H of this guide.

A GAR Risk Assessment model, which creates a GO/NO-GO decision tool, should be conducted individually by each member of the team on the Operational/Mission Risk Assessment Worksheet prior to initial dispatch. Individual scores will be compiled on the spotter or manager’s Operational/Mission Risk Assessment Worksheet and be reviewed and discussed by all members of the team. If there are any mitigations, they will be discussed and documented on the worksheet. The assessment may be completed at the beginning of an operational period, and it should be reviewed and updated if the team or mission changes or if other mission-specific information becomes available. 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 concurrence. Rappel operations with a post-mitigation score in the red will need line officer or IC approval to proceed with the mission.
II. Risk Control Categories

A. Supervision

Supervisory control considers how qualified the supervisor is and whether effective supervision is taking place. 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.

B. Planning

Planning and communication should consider how much information you, your team, and other resources with whom you may be interacting have: Does everyone have the same information? How accurate is the information? Is there adequate time to plan for and evaluate the existing and emerging conditions? What is the availability of contingency resources and how reliable is the communication infrastructure? Can effective CRM be established with this information?

C. Team Selection

Team selection for the stated mission should consider the knowledge, skills, proficiency and competence of the individuals. 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.

D. Environment

Consider the area of operation that could influence the performance of the aircraft, including but not limited to, density altitude, temperature, wind, topography, etc. Known factors such as terrain, forest canopy, and site selection should be eyed with caution as the operational environment is very dynamic.

E. 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. Potential for large fire growth or medical response and multiple resources responding to incident both ground and air.
### III. Risk Assessment Rating System Explanation

<table>
<thead>
<tr>
<th>Supervision</th>
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<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>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>
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<td>1 - 2 - 3 - 4 - 5</td>
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<table>
<thead>
<tr>
<th>Planning</th>
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<tr>
<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 adaptation. Time is well managed. CRM is in place and well versed on with all parties. Adequate personnel and technology are available to relay information accurately to those who make the decisions. Contingency personnel, resources and equipment are available.</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. CRM is poor or not utilized. Communications are poor between personnel. Communication equipment is lacking efficiency and coverage of response area. No contingency personnel, resources, or equipment.</td>
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<thead>
<tr>
<th>Team Selection</th>
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<tbody>
<tr>
<td>Multiple personnel are trained, proficient, healthy and rested prior to starting the mission. Personal issues are addressed and little external stress is being exerted. 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>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. Personnel lack training. Personnel have been squeezing in many additional duties as assigned distracting them from their proficiency or personal life.</td>
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<tr>
<th>Environment</th>
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<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>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>
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<tr>
<th>Mission Complexity</th>
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<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. Fire activity is at a minimum. Non-emergency medical operation.</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. Fire activity and numerous resources responding. Immediate response medical emergency.</td>
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IV. Daily Operational/Mission Risk Assessment Worksheet

<table>
<thead>
<tr>
<th>Risk Score</th>
<th>SPOTTER</th>
<th>IC</th>
<th>PILOT</th>
<th>BASE MANAGER</th>
<th>TEAM MITIGATION SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>GREEN</td>
<td>0 - 11</td>
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<td></td>
<td></td>
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<tr>
<td>AMBER</td>
<td>12 - 19</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RED</td>
<td>20 - 25</td>
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Risk rated 1-5 for each category. Mitigations should be considered for any category rated higher than 3. If one or more categories rate higher than 3, a team mitigation needs to be completed for that category. A team-mitigation will also have to be completed if the total of the individual score is greater than 12.

**Supervision:** Presence, accessibility, and effectiveness of leadership for all teams and personnel. Clear chain of command.

**Planning:** Adequate briefings and mission planning time available. Shared communications plan. Radio communications available throughout area of operations.

**Team Selection:** Level of individual training and experience. Level of team member’s rest/fatigue, physical fitness, morale, and absence of outside distractions. All team member’s current in required qualifications and standardized procedures.

**Environment:** Extreme temperatures, elevation, difficulty of terrain (aspect, canopy, slope, etc.), long approach, remoteness.

**Incident Complexity:** Potential for incident that would tax the current staffing levels. Potential for large fire growth or medical response. Severity and probability of mishap.

**Total:**

1 The team-mitigation column would be used if any one team member’s overall score goes into the amber or red, or if an individual rates any category higher than a 3. Mitigation measures will be documented on the following page. If the team’s consensus mitigation score stays in the red, they will need Line Officer or IC approval to proceed with the mission.

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.

**Crew/Team Mitigations:**

1.  
2.  
3.  
4.  
5.
Appendix H – Rappel Risk Management for Fire Missions

NOTE: The use of this appendix is not mandatory. It is intended to be used as a supplement to other risk management training tools.

I. 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 and spotter 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.

B. 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.

1. Cargo secured and checked by spotter.
   a. Ropes 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.)

C. 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. Any of the above conditions may be an indicator of hazardous landing, rappelling, or firefighting conditions. 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?

D. Arrival on scene

1. Check airspace for other aircraft before approaching fire area.

2. Establish & maintain positive ICS with pilot & IC/RIC. Inform dispatch of arrival.

3. Conduct high-level recon prior to transition to low-level recon. Look for wires, cables, utility 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 a potential safety zone:

      i. Most light fuels, including brush (if present), must have been consumed
      ii. The burned area must have cooled sufficiently to permit human occupation without excessive heat exposure
      iii. 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

II. Deployment

A. 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

B. 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:** If option to land at site adjacent to fire is 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

C. Decision Point 4

**Off-site landing that requires 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 maintain adequate distance 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 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 not to 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 and tail rotors 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 and rigging
because rotors are turning or because they are concerned about the fire
increasing in size while they are absent.

d. Ropes and descent devices rigged and checked by spotter.

e. Cargo secured and checked by spotter.

f. Rappellers and spotters put on harnesses and rappel gear.

g. Rappellers complete buddy checks.

h. Spotter performs pre-flight walk-around check of helicopter and landing site
before completing rappeller checks.

i. Rappeller checks completed by spotter. Conduct last review with pilot and
rappellers to ensure nothing has been overlooked and everything is ready to

j. Establish and 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 and
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.

D. Decision Point 5

Ridge top rappel site available above fire allows for possible rapid engagement
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.
a. Conduct a 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.

b. Take into consideration that it is often easier to maintain a stable hover on a ridge top than on a hillside or in drainage.

2. 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.

3. 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.

4. 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.

5. If there are firefighters already on the ground, establish communications before proceeding. Spotter should advise firefighters 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.

6. Main & tail rotor must maintain adequate safety clearance from terrain or trees.

7. 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.

   a. 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 and spotter should jointly re-evaluate proposed rappel site and micrometeorological conditions, re-entry into same site should occur only if conditions substantially improve.

NOTE: See Chapter 6 of the NROG for Rappel and Cargo Operations Emergency Procedures

E. Decision Point 6

   Rappel site available nearby but located above fire; fuel and weather conditions may 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 and mitigation process from risk Decision Point 4 (except for direction to use ridge top 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.
F. Decision Point 7
   No safe landing or rappel site.
   1. Do not deploy personnel.

III. Post Deployment and Pre-Engagement

   A. Actions

   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 hazards, 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.

      a. If positive radio communications cannot be established between firefighters on ground and dispatch, firefighters should not engage the fire.

   4. Before engaging the fire, IC/RIC should perform a risk assessment using the risk management process from the Incident Pocket Response Guide.

      a. Other firefighters should participate in this process; the results should be shared with all present.
Appendix I – Rappel Base Review

I. Quality Assurance Review Standards

The national rappel specialist (NRS) and the national helicopter operations specialist (NHOS) will coordinate national-level quality assurance reviews to ensure that rappel operations comply with national and interagency standards. This level of review should be conducted at all rappel bases at least once every two years; equipment, training, facilities, and records must be reviewed to ensure that standardization requirements are met.

II. Unit, Facilities, and Procedure Inspections

Regional HOS or rappel specialist should conduct rappel unit reviews at least once every two years to ensure that operations are safely performed and conform to established standards. Base managers shall document this review of each rappel unit, as scheduled.

III. Administrative Inspections

Administrative inspections will examine management practices regarding planning, organization, staffing, supervising, and reporting.

A. The inspection shall include, but not be limited to, the following:

1. Personnel staffing, management and organization
2. Operating plans, training schedules, and instructor assignments and qualifications
3. Management practices, quality and timing of reports, records maintenance, work schedules, safety and health
4. Inventory management, procurement and replacement schedules, use practices, and security

IV. Procedures Inspections

Procedures inspections must review operating practices related to mission effectiveness and safety. Reviews shall examine operational areas for compliance and standardization with established procedures.

A. Review shall include:

1. The structure and methodology of rappel training
2. Cargo letdown packaging, aircraft loading, and cargo restraint
3. Dispatching, personnel and load manifesting
4. Preflight, in-flight, and exit procedures for rappels
5. Spotting procedures
6. Other fire suppression and ground procedures
V. Facility Inspection

An annual inspection by the appropriate personnel of the facilities and associated equipment is recommended. This inspection is a review of the adequacy and safety compliance and use of the Rappel Operations Review Checklist.

The checklist starting on the next page is the standard template used by the Rappel Quality Assurance Team when conducting a rappel compliance review. The actual form used by the team may be updated or modified to address current programmatic, operational, or equipment changes and emphasis.
National Rappel Operations Review Checklist Cover Page

Base:

Inspection Date:
National Rappel Operations Review Checklist

I. Introduction

The national aviation office in conjunction with regional representation will conduct an evaluation of helicopter rappel programs as part of the 2010 Rappel Quality Assurance (QA) Plan as outlined in the Rappel Program Strategic Risk Assessment Action Plan Response. All rappel programs should have adequate time, as acknowledged by the evaluators, to respond to the evaluation deficiency and to identify corrective action planned or already taken.

II. Purpose

The purpose of the rappel QA review is to ensure that all rappel programs are meeting the intent of the national standardization effort, abiding by the National Rappel Operations Guide (NROG), and providing a quality assurance program. This information will also be utilized to provide a detailed report to the national aviation staff to ensure the quality assurance program is progressive, appropriate and consistent with the mission of aerial delivery of personnel via helicopter.

III. Applicability

The format contained in the National Rappel Operations Checklist was developed by the national rappel specialist (NRS) with oversight provided by the national helicopter operations specialist (NHOS). This document may be revised or updated as needed or applicable.

The following items will be needed for the QA review.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>1</td>
<td>Base Operations Plan</td>
</tr>
<tr>
<td>2</td>
<td>Forest/Unit Aviation Plan</td>
</tr>
<tr>
<td>3</td>
<td>National Rappel Operations Guide</td>
</tr>
<tr>
<td>4</td>
<td>Rappel Equipment Database (RapRec)</td>
</tr>
<tr>
<td>5</td>
<td>Rappeller/Spotter Training Records</td>
</tr>
<tr>
<td>6</td>
<td>Rappel Equipment Records</td>
</tr>
<tr>
<td>7</td>
<td>Base Organizational Chart</td>
</tr>
<tr>
<td>8</td>
<td>Fire Qualifications (IQCS overview)</td>
</tr>
<tr>
<td>9</td>
<td>Rappel Aircraft</td>
</tr>
<tr>
<td>10</td>
<td>Location for Rappel Ride-Along</td>
</tr>
</tbody>
</table>

IV. Team composition

At a minimum, the Rappel QA Review Team will consist of the national rappel specialist (NRS), rappel check spotter, and regional helicopter operations specialist.

The Rappel QA may be conducted in conjunction with the National Helicopter Contract Compliance Team, including an aviation maintenance inspector (AMI), helicopter inspector pilot (HIP), national helicopter operations specialist (NHOS), regional helicopter operations specialist (RHOS), and safety and training specialist (S&TS).
All attempts should be made to fill the RHOS, AMI, HIP and check spotter from outside the geographical area.

V. Responsibility and Instruction for Completion

Aviation management at the national level is responsible for conducting the evaluation. Annual reviews are recommended until such time as evaluation time frames are established. The crew should be allowed a minimum of one week to prepare for the review.

A. Completion of individual items is self-explanatory. The following is recommended as an overall approach:

1. The rappel base manager should utilize the evaluation checklist to prepare for the visit by the team. It can also be used as a means of self-evaluation throughout the season.

2. In order to cover the functional area in a reasonable amount of time, it is recommended that each member of the evaluation team cover a separate section of the functional area, with others on the team concurrently completing their assigned area.

3. A closeout with local line officers, regional aviation members, and local fire management to review both deficiencies and positive aspects of the program is essential. A copy of the National Rappel Operations Review Checklist will be provided to the RAO, RHOS and local line officer.

4. A formal follow-up should be made to ensure corrective action has been taken to rectify deficiencies.

5. Items marked with an asterisk are identified as not having a current standard. These items should not be rated, but information should be documented as to possibility of identified standards.

VI. Routing and Filing:

Formal submission to the local line manager is essential, with follow-up reply from the local unit to ensure the corrective actions have been accomplished. Regional aviation management should keep past evaluations on file in order to ensure that items identified in previous visits have been addressed and are nonexistent in future evaluations.
# Evaluation Team Members

<table>
<thead>
<tr>
<th>NAME</th>
<th>AGENCY</th>
<th>POSITION</th>
<th>PHONE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>USFS</td>
<td>Rappel Specialist</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>QA Lead</td>
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<tr>
<td></td>
<td>USFS/NTDP</td>
<td>Rappel Equipment Specialist</td>
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</tr>
<tr>
<td></td>
<td>USFS/</td>
<td>Check Spotter</td>
<td></td>
</tr>
</tbody>
</table>
# Rappel Quality Assurance Review Checklist

## RAPPEL BASE: ________________________________

## DATE OF REVIEW: ________________________________

Code Key:  
- **E** = Exceptional  
- **M** = Meets Standard  
- **NI** = Needs Improvement  
- **NR** = Not Reviewed

<table>
<thead>
<tr>
<th>#</th>
<th>PROGRAMMATIC EVALUATION CRITERIA</th>
<th>Last Review Code</th>
<th>Current Review Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>N-1</td>
<td><strong>Organizational Structure</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Base manager name: ___________________________</td>
<td></td>
<td><strong>N/A</strong></td>
</tr>
<tr>
<td></td>
<td>Base managers' supervisor name: ___________________________</td>
<td></td>
<td><strong>N/A</strong></td>
</tr>
<tr>
<td></td>
<td>Review and obtain copy of base organizational chart</td>
<td></td>
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<tr>
<td></td>
<td>Crew meets minimum crew size requirements per NROG. Current crew size: _______</td>
<td></td>
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<tr>
<td>N-2</td>
<td><strong>Qualifications</strong></td>
<td></td>
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<tr>
<td></td>
<td>Obtain copy or review crew qualifications</td>
<td></td>
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<tr>
<td></td>
<td>Program seeks opportunities for employee career development e.g., IMT involvement, details</td>
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<tr>
<td></td>
<td>Obtain copy or review pilots interagency pilot card (ensure rappel sign-off)</td>
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<tr>
<td>N-3</td>
<td>Training</td>
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<tr>
<td></td>
<td>Rappel and spotter currency standards are being met per NROG</td>
<td></td>
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<tr>
<td></td>
<td>Frequency of proficiencies? HERS maintaining HRAP currency?</td>
<td></td>
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<tr>
<td></td>
<td>Program has access to typical-terrain proficiency rappel sites (local unit)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Crew performs typical-terrain proficiencies (post rappel academy). Last typical terrain:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Crew performs readiness drills, i.e. crash/rescue, medical, fire. Last readiness drill:</td>
<td></td>
<td></td>
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</tbody>
</table>

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<thead>
<tr>
<th>N-4</th>
<th>Mission Readiness</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Crew is committed to, and has a culture of physical fitness</td>
</tr>
<tr>
<td></td>
<td>Fire-ready list is available (up-list/rotation board)</td>
</tr>
<tr>
<td></td>
<td>Morning briefings are being conducted</td>
</tr>
<tr>
<td></td>
<td>Program has a system in place that addresses boosters (check-in, briefing, rotation order)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>N-5</th>
<th>Risk Management</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Risk assessments tools are being utilized, i.e. Green-Amber-Red (GAR)</td>
</tr>
<tr>
<td></td>
<td>Spotters have documented Crew Resource Management Training (3.0 hour initial or 1.5 hour refresher).</td>
</tr>
</tbody>
</table>
### Safety

- Program is adhering to work/rest guidelines
- Do personnel have concerns or comments regarding the 2019 next-gen rappel equipment transition?  
  - Document below  
  - Document below
- SafeRap reporting system is accessible to all personnel
- SafeRap reports are available to all personnel (hard-copy posted, and/or electronically available)
- Rappel-related Safety Alerts, Tech Tips, and Information Bulletins are hard-copy posted or e-filed
- Change blindness training is being conducted per NROG standards
- Change blindness training controls in-place to ensure mis-rigged items are NOT used operationally
- Has the crew had any rappel or pack-out related injuries? Were CA-1s completed?  
  - Document below  
  - Document below

### Reference Material

- NROG available at base, and on support truck (hard-copy or downloaded electronic copy)
- Base Operations and Forest Aviation Plan(s) address rappel operations

### QA TEAM PROGRAMMATIC REVIEW NOTES
<table>
<thead>
<tr>
<th>#</th>
<th><strong>RAPPEL AIRCRAFT EVALUATION CRITERIA</strong></th>
<th>Last Review Code</th>
<th>Current Review Code</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Evaluator: National Rappel Specialist (with airworthiness inspector as applicable)</strong></td>
<td></td>
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<tr>
<td></td>
<td><strong>Evaluate with: Pilot, mechanic, and one spotter</strong></td>
<td></td>
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<tr>
<td>N-8</td>
<td><strong>Rappel Aircraft Safety and Performance</strong></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Spotter is aware of aircraft weight and balance parameters</td>
<td></td>
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<tr>
<td></td>
<td>Pilot has completed weight and balance calculations for various rappel configurations</td>
<td></td>
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<tr>
<td>N-9</td>
<td><strong>Rappel Bracket</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ELAM installed, inspected, and documented by mechanic per applicable STC</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ELAM inspected daily by qualified rappel spotter</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Carabiners approved for human external load attached per NROG standard (Rock Exotica/rockD)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Carabiners approved for cargo operations attached per NROG standard (SMC manual-locking)</td>
<td></td>
<td></td>
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<tr>
<td>N-10</td>
<td><strong>Spotter Tether Anchor System</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ring/stud installed per ELAM STC</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ARS (18&quot;) installed per NROG CH. 5. ARS has date stamp or tag</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Life cycle 5 years from in-service, use from DOM if unknown</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N-11</td>
<td><strong>Cargo</strong></td>
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<td>------</td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cargo installed and secured with approved straps</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td><em>Life cycle 10-years from DOM</em></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Cargo netting, posts, and seats installed per NROG/STC</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Figure 8s available, and meet wear and functionality inspection</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Accordion line packs available and securely stowed</td>
<td></td>
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<thead>
<tr>
<th>N-12</th>
<th><strong>Rappeller Tether(s)</strong></th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Inspected and logged annually</td>
</tr>
<tr>
<td></td>
<td>Tagged with identifier, including date-of-manufacture</td>
</tr>
<tr>
<td></td>
<td><em>Life cycle 5-years from in-service date, use from DOM if unknown</em></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>N-13</th>
<th><strong>Surfaces</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Skid protectors installed per STC</td>
</tr>
<tr>
<td></td>
<td>Flight step outer edges are smooth, preventing damage to ropes and cargo letdown lines</td>
</tr>
<tr>
<td></td>
<td>Passenger cabin floor sill(s) are smooth, preventing damage to ropes and cargo letdown lines</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>N-14</th>
<th><strong>Avionics</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Aircraft radios, ICS system, wireless drop cords (if applicable) are functioning properly</td>
</tr>
</tbody>
</table>

**QA TEAM RAPPEL AIRCRAFT REVIEW NOTES**
<table>
<thead>
<tr>
<th>#</th>
<th>RAPPEL EQUIPMENT EVALUATION CRITERIA</th>
<th>Last Review Code</th>
<th>Current Review Code</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Evaluators: Rappel Check Spotter (with QA team member assistance as needed)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Evaluate with: Equipment manager (or spotter) and two rappellers</td>
<td></td>
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<tr>
<td>N-15</td>
<td><strong>Electronic Equipment Database (RapRec)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>System is accessible and updated (review with equipment manager)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Individual Records</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N-16</td>
<td>Spotter Training Record is kept, and is up to date (review w/ one spotter)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rappeller Training Record is kept, and is up to date (review w/ two rappellers)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N-17</td>
<td><strong>Rappel Harness System</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Life Cycle is 10-years from DOM for harness</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tagged with identifier, including in-service date (manufacture tag may be used)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>User understands inspection criteria (review with two rappellers)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Condition of rappel harness and carabiner (w/ lanyard pin) meet NROG standard</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Raptor Knife attached to harness and inspected per standard (review w/ two rappellers)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Confirm the Rappel Equipment Inspection Form is being kept and is up to date (w/ two rappellers)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N-18</td>
<td><strong>Rappeller Gear</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Approved BD bag is in serviceable condition, contains minimum contents, and does not exceed 30 pounds</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rappeller PPE is in serviceable condition (flight helmet, rappel gloves, eye protection, Nomex, boots)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Program has adequate stocking levels and issues serviceable line packs, gear bags, fireline items</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Spotter Harness System</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>---------------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Life Cycle is 10-years from DOM for harness and tether</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tagged with identifier, including DOM (manufacture tag may be used)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spotter tether tagged with identifier, FS manufacture location, serial number, and DOM</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>User understands inspection criteria (review with 1 spotter)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Condition of spotter harness, and extendable tether meet NROG standard</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confirm that Rappel Equipment Inspection Form is being kept and up to date (w/ one spotter)</td>
<td></td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Rappel Rope</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Life Cycle is 5-years from in-service date, use from DOM if unknown</em></td>
</tr>
<tr>
<td>Marked with &quot;A&quot; and &quot;B&quot; ends</td>
</tr>
<tr>
<td>Rope identified by length, serial #, DOM, (under termination protector), with ends marked A or B.</td>
</tr>
<tr>
<td>User understands inspection criteria (review with 2 rappellers)</td>
</tr>
<tr>
<td>Condition of rope meets NROG/manufacturer standards</td>
</tr>
<tr>
<td>Rope bags are identified by: 250' orange, 300' yellow</td>
</tr>
<tr>
<td>Ropes are stored in clean/dry area(s) with &quot;OK&quot; tags</td>
</tr>
<tr>
<td>Confirm that Rappel Equipment Inspection Form is being kept and up to date (w/ equipment mgr.)</td>
</tr>
<tr>
<td>N-21</td>
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<table>
<thead>
<tr>
<th>N-22</th>
<th>Cargo Deployment Equipment (Hardware)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SMC Lite Stainless Steel Locking Carabiners meet wear and functionality criteria</td>
</tr>
<tr>
<td></td>
<td>CMC Rescue 8 (aluminum or steel) meet wear and functionality criteria</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>N-23</th>
<th>Cargo Deployment Equipment (Lines)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Life cycle is 10-years from DOM</td>
</tr>
<tr>
<td></td>
<td>Line tagged with identifier, including USFS location, serial number, and DOM</td>
</tr>
<tr>
<td></td>
<td>Lines clearly marked with black dye (25-foot section each end, 10-foot section in middle). Pre 2019, ok to have “contrasting” color</td>
</tr>
<tr>
<td></td>
<td>Accordion Packs are identified by: 250’ white w/ black seam tape, 300’ white w/ yellow seam tape</td>
</tr>
<tr>
<td></td>
<td>Packing and logging of line(s) meets NROG standard</td>
</tr>
<tr>
<td></td>
<td>Confirm that Rappel Equipment Inspection Form is being kept and up to date (w/ equipment mgr.)</td>
</tr>
</tbody>
</table>
| N-24 | **Cargo Deployment (Containers)**  
      | Cargo Box Harness and Soft Loops – Life cycle is 10-years from DOM |  |
|------|---------------------------------------------------------------|---|
|      | Cargo containers meet NROG approval and packing standards (verify minimum contents) |  |
|      | Using Cargo Box Harness-#MTDC-1088, Cubitainer Harness-#MTDC 1087, Cargo Loop-#MTDC-1112 |  |

**QA TEAM RAPPEL EQUIPMENT REVIEW NOTES**
<table>
<thead>
<tr>
<th>#</th>
<th>RAPPEL OPERATIONS EVALUATION CRITERIA</th>
<th>Last Review Code</th>
<th>Current Review Code</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Evaluators: Rappel check spotter (with QA team member assistance as needed)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Evaluate with: Pilot, rappel spotter and a load of 2 or 4 rappellers w/cargo</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N-25</td>
<td><strong>Mission Planning</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Load calculations and manifests are complete, accurate, and posted</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Morning briefing conducted with crew/vendor staff (roll-call, fire weather, ready-list, SafeRap, SAFECOM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pilot, mechanic, and driver available, on-site, and prepared to perform mission</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Weight and balance calculations are completed by pilot (if non-standard load is part of review)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>GAR completed (crew discusses and provides mitigation factors to items deemed high-risk)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N-26</td>
<td><strong>Preflight Briefing</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Location of operation identified</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Spotter informs rappellers with mission information</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Spotter and pilot discussion (rappellers to-be-deployed, emergency procedures, overall CRM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N-27</td>
<td><strong>Aircraft Configuration</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Aircraft configured per NROG (Chapter 5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>N-28</strong></td>
<td><strong>Rappel Rigging</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Spotter demonstrates rappel bracket daily check</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Approved carabiners installed correctly</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ropes routed and connected correctly with approved carabiners</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Spotter demonstrates rappeller tether daily check</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Figure 8 available and connected to door bracket with approved carabiner</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cargo installed and secured with approved cargo restraint</td>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>N-29</strong></th>
<th><strong>Boarding Sequence</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Spotter performs rappeller check(s) and boarding sequence</td>
</tr>
<tr>
<td></td>
<td>First-in rappeller (per side) performs rappel equipment checks</td>
</tr>
<tr>
<td></td>
<td>Last-in rappeller performs spotter check</td>
</tr>
<tr>
<td></td>
<td>Spotter performs aircraft check, boards aircraft, inspects rappel rigging and rappellers</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>N-30</strong></th>
<th><strong>In-Flight Procedures</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pilot/spotter perform high/low-level recon (identifies hazards as appropriate)</td>
</tr>
<tr>
<td></td>
<td>Spotter identifies emergency site</td>
</tr>
<tr>
<td></td>
<td>Spotter selects primary rappel site (discusses alternate site options)</td>
</tr>
<tr>
<td></td>
<td>High-hover power check completed</td>
</tr>
<tr>
<td></td>
<td>Positive rate-of-climb achieved</td>
</tr>
<tr>
<td></td>
<td>Doors opened as appropriate (master caution reset)</td>
</tr>
<tr>
<td>N-31</td>
<td><strong>Rappel Sequence</strong></td>
</tr>
<tr>
<td>------</td>
<td>---------------------</td>
</tr>
<tr>
<td></td>
<td>Effectively positions aircraft over rappel site</td>
</tr>
<tr>
<td></td>
<td>Initiates rappel sequence in maximum-continuous power parameters</td>
</tr>
<tr>
<td></td>
<td>Initiates and follows rappel sequence</td>
</tr>
<tr>
<td></td>
<td>Spotter/pilot communications are clear and concise (challenge and response protocols followed)</td>
</tr>
<tr>
<td></td>
<td>Spotter clears aircraft before directing movement</td>
</tr>
<tr>
<td></td>
<td>Rappellers follow established standards throughout process</td>
</tr>
<tr>
<td></td>
<td>Spotter gives appropriate hand signals</td>
</tr>
<tr>
<td></td>
<td>Adequate rotor clearance maintained throughout sequence</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>N-32</th>
<th><strong>Cargo Deployment</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Effectively positions aircraft over cargo site</td>
</tr>
<tr>
<td></td>
<td>Initiates cargo sequence in maximum-continuous power parameters</td>
</tr>
<tr>
<td></td>
<td>Initiates and follows cargo sequence</td>
</tr>
<tr>
<td></td>
<td>Spotter/pilot communications are clear and concise (challenge and response protocols followed)</td>
</tr>
<tr>
<td></td>
<td>Spotter clears aircraft before directing movement</td>
</tr>
<tr>
<td></td>
<td>Adequate rotor clearance maintained throughout sequence</td>
</tr>
</tbody>
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**QA TEAM RAPPEL OPERATIONS REVIEW NOTES**
## Functional Area- Summary

(Review with manager, crew, and vendor as appropriate. Closeout with local fire management. Submit formal evaluation as soon as possible.)

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<th>GENERAL READINESS OF THE BASE</th>
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<table>
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<tr>
<th>ITEMS WHICH ARE DEFICIENT</th>
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<tbody>
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<table>
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<tr>
<th>CORRECTIVE ACTION TO BE TAKEN</th>
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</table>
Functional Area – Recommendations and Follow-Up Requirements

(Review With manager, crew, and vendor as appropriate. Closeout with local fire management. Submit formal evaluation as soon as possible.)

<table>
<thead>
<tr>
<th>DUE DATE</th>
<th>EVALUATION SECTION</th>
<th>REQUIREMENT OR RECOMMENDATION</th>
<th>DATE COMPLETE</th>
</tr>
</thead>
<tbody>
<tr>
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Appendix K – Charters

National Rappel Working Team Charter

I. Background:

To provide operational oversight for the Forest Service (FS) National Rappel Program, the Director of Fire and Aviation Management has established the National Rappel Working Team.

II. Objective

The National Rappel Working Team will assure and support the development, implementation, and monitoring of the standardization of all FS rappel operations. This includes crew structure, equipment, helicopters, training, operations, facilities and data management systems.

III. Name

The FS National Rappel Working Team is hereinafter referred to as the NRWT.

IV. Authority

The NRWT is chartered by the FS Director of Fire and Aviation Management (FAM). The deliberations within NRWT are exempt from the Federal Advisory Committee Act under section 04 of the Unfunded Mandates Reform Act of 1995.

The NRWT reports to and receives direction from the Assistant Director Aviation and the Assistant Director Operations (ADs) WO Fire and Aviation Management. The Director of FAM authorizes the Chair of the NRWT to convene meetings, schedule agenda items, make contacts, negotiate work assignments, and make commitments. The NRWT may charge members or technical specialists with tasks, or create working groups and task teams as authorized by the ADs.

V. Purpose

The NRWT will develop and oversee FS rappel operations in support of FS fire management - rappel mission requirements, contract development, operational compatibility, policies and procedures for the FS National Rappel Program. The purpose will include developing rappel policy, procedures and standards, mission requirements, aircraft, equipment and support services specifications for acquisition, and working with other federal agencies, aviation specialists and maintenance experts to ensure
compliance with Federal Aviation Regulations and agency policy. The NRWT recommends and submits any policy change to the Director of Operations.

**VI. Organization and Membership**

The NRWT is comprised of the National Rappel Specialist (NRS) and the Regional Helicopter Operations Specialists (RHOS) from regions with designated rappel program(s). The NRWT is chaired by the NRS. The co-chair is one of the RHOS from the regions listed above. The term for the co-chair is two years.

A. NRWT includes two established subcommittees:

1. The Rappel Operations Subcommittee (ROS) is made up of current rappel base managers or their designee from regions with designated rappel program(s). One voting member per region is designated by the corresponding RHOS.
   
   a. The programmatic focus areas are:
      
      i. Monitor operational efficiency and effectiveness
      
      ii. Staffing (crew size, structure, type of employment, qualifications)
      
      iii. Recruitment and retention (experience, diversity, hiring standards, career development)
      
      iv. Rappel aircraft (configuration, next-generation aircraft, aircraft accessories)

2. The Rappel Training Subcommittee (RTS) is made up of current rappel check spotters from regions with designated rappel program(s). RTS voting members are designated by the corresponding RHOS. If a region does not have a check spotter, the RHOS will designate a base manager, assistant, or check spotter from another region.
   
   a. The training and technical focus areas are:
      
      i. Standardization
      
      ii. Procedures
      
      iii. Training
      
      iv. Certification
      
      v. Assurance

3. The subcommittees will appoint a chair with the chair holding the position for two years.
4. The Technical Specialists membership is minimally comprised of:
   i. Rappel Equipment Specialist, NTDP (Missoula)
   ii. National Aeronautical Engineer
   iii. National or Regional Avionics
   iv. National Aviation Maintenance Inspector
   v. National Helicopter Operations Specialist
   vi. National or Regional Helicopter Inspector Pilot
   vii. Regional Fire Directors (R1, R4, R5, R6)
   viii. National Aviation Management Specialist
   ix. National or Regional Aviation Safety Manager
   x. The Technical Specialists participation will be on a request basis by the Chair.

The terms of tenure are indefinite for the NRWT and the Technical Specialists. The Chair is authorized to convene meetings and to schedule agenda items. The Chair is also authorized to make contacts, negotiate work assignments, make commitments on behalf of the NRWT, and to commit such resources as are available within the working team or as authorized by the AD of Aviation. The Co-chair will assume duties in the absence of the Chair.

Voting membership consists of one member from each active Region and the NRS. A quorum of four members or designee must be present to be considered a voting body.

VII. Cooperation and Coordination

The NRWT coordinates directly with the National Aviation Branch Chiefs.

The NRWT will forward decisions to the Branch Chief, Aviation Operations and the AD Aviation for review. The AD Aviation will forward recommended decisions to the Director of FAM for approval.

The NRS is a member and Chair of the Interagency Helicopter Rappel Unit (IHRU). The IHRU is comprised of the FS rappel program and Department of the Interior Bureaus that have active rappel and cargo letdown operations. The IHRU is under the direction of the Interagency Helicopter Operations Subcommittee. The IHRU collaborates, and shares information pertaining to items such as, rappel equipment development, rappel aircraft screening/evaluation, and programmatic direction or change.

VIII. Responsibility

The NRWT has the primary responsibility of developing the FS National Rappel program in support of fire management operations as approved by the Director of FAM.
IX. Working Group Life Limit

The NRWT will be in effect from the recognized approval date, as stated below, unless re-chartered by the AD of Aviation.

X. Charter Approval

This charter rescinds the NRWT charter approved by the Director of FAM on September 1, 2011.

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

Approved:

__________________________

Shawna Legarza
Director, Fire and Aviation Management

__________________________

Date:
National Rappel Operations Subcommittee Charter

I. Background:

To provide support to the National Rappel Working Team (NRWT), the Chair of the NRWT has established the National Rappel Operations Subcommittee.

II. Objective

The primary mission for the National Rappel Operations Subcommittee is to establish a formal process for review and evaluation of current rappel program standards for the United States Forest Service (FS). Based on those evaluations, the National Rappel Operations Subcommittee will submit recommendations to the NRWT.

A. The programmatic focus areas are:

1. Monitor operational efficiency and effectiveness
2. Staffing (crew size, structure, type of employment, qualifications)
3. Recruitment and retention (experience, diversity, hiring standards, career development)
4. Rappel aircraft (configuration, next-generation aircraft, aircraft accessories)

III. Name

The National Rappel Operations Subcommittee is hereinafter referred to as the ROS.

IV. Authority

The ROS reports to and receives direction from the NRWT. The NRWT authorizes the Chair of the ROS to convene meetings, schedule agenda items, make contacts, negotiate work assignments, and create working groups or task teams.

The Chair may also charge technical specialists listed in the NRWT charter with tasks.

V. Purpose

The ROS will solicit, review, and evaluate inputs from the field on rappel operations (efficiency, effectiveness, safety), and program management from the FS Helicopter Rappel Program. The ROS will prepare and submit proposals and recommendations to the NRWT.
VI. Group Composition

The ROS is composed all rappel base managers or designee. One voting member per region is designated by the corresponding Regional Helicopter Operations Specialist (RHOS).

Other technical specialists may be requested as needed.

All voting members must be present to be considered a voting body. A proxy may be designated with concurrence from the RHOS for participation in ROS business.

In the event of a split decision, the NRWT will be the deciding vote.

VII. Replacement of Voting Members

Replacement of voting members will be solicited from the respective RHOS.

VIII. Selection of the Chairpersons

The Chairperson selection will start with Region 6. The Co-chair will be elected by the Rappel Operations Subcommittee. The Co-chair shall not be from the same region as the current chair and is recommended to not be a member of the Rappel Training Subcommittee. The Chair and Co-chair will serve a term of two years; at the end of the two year term, the Co-chair will become the Chair.

IX. Charter Approval

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

Approved:

/s/ Eric J. Bush

12 March, 2019

Eric J. Bush
National Rappel Specialist, NRWT Chair

Date
National Rappel Training Subcommittee Charter

I. Background:

To provide support to the National Rappel Working Team (NRWT) in all Forest Service (FS) National Rappel Program matters, the Chair of the NRWT has established the National Rappel Training Subcommittee.

II. Objective

The primary mission for the National Rappel Training Subcommittee is to establish a formal process for standardization, review and evaluation of current or proposed helicopter rappel equipment, rappel procedures, training, certification and assurance for the Forest Service. Based on those evaluations, the National Rappel Training Subcommittee will submit recommendations to the NRWT.

III. Name

The National Rappel Training Subcommittee is hereinafter referred to as the RTS.

IV. Authority

The RTS reports to and receives direction from the NRWT. The NRWT authorizes the Chair of the RTS to convene meetings, schedule agenda items, make contacts, negotiate work assignments, and create working groups or task teams.

The Chair may also charge technical specialists listed in the NRWT charter with tasks.

V. Purpose

The RTS will solicit, review, and evaluate inputs from the field on rappel training, equipment and procedures standardization from the FS Rappel Program. The RTS will respond to issues and concerns regarding currently approved rappel equipment and procedures. The RTS will prepare and submit proposals and recommendations to the NRWT.

VI. Group Composition

The RTS is made up of current designated rappel check spotters, to include at a minimum, one member from each active rappel region. One voting member per region is designated by the corresponding Regional Helicopter Operations Specialist (RHOS). If a region does not have a check spotter, the RHOS will designate a voting member (base manager, assistant, or check spotter from another region).
A. The training and technical focus areas are:

1. Standardization
2. Procedures
3. Training
4. Certification
5. Assurance

To ensure that subcommittee(s) recommendations for revisions to rappel equipment, cargo letdown equipment, or rappel and cargo letdown procedures reflect applicable technical and safety standards, the National Technology and Development Center (NTDP) rappel equipment project leader will participate as needed in evaluations, meetings, conference calls, and communications as a non-voting member and technical advisor.

Other technical specialists may be requested as needed.

All voting members must be present to be considered a voting body. A proxy may be designated with concurrence from the RHOS for participation in RTS business.

In the event of a split decision NRWT will be the deciding vote.

VII. Replacement of Voting Members

Replacement of voting members will be solicited from the respective RHOS.

VIII. Selection of the Chairpersons

The Chairperson selection will be in numerical rotation starting with Region 1. The rotation will progress in order every two (2) years. The Co-chair will be the next Region in order. The Chair and Co-chair will serve a term of two (2) years; at the end of the two-year term, the Co-chair will become the Chair.

IX. Charter Approval

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

Approved:

/s/ Eric J. Bush  12 March, 2019

Eric Bush
National Rappel Specialist, NRWT Chair
# Appendix M – Significant Revisions

## I. 2016-2019 Revisions

The table below shows material changes between the 2016 and the 2019 NROG. The table should be used to identify what changes have been made and where to find them in the guide. The descriptions of the changes in the table are paraphrased, and the reader should consult the body of the NROG for the actual policy.

<table>
<thead>
<tr>
<th>Page, Chapter, Section, Description of Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cover</strong></td>
</tr>
<tr>
<td>ii, Preface, Table of Contents, Moved table of contents to front of document, other introductory items moved back</td>
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<tr>
<td>iv, Preface, National Rappel Operations Guide Approval</td>
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<tr>
<td>x, Preface, NROG Revision Summary</td>
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<td>3-1, Chapter 3, I, B Pilot Rappel Training Syllabus, 4</td>
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<td>3-3, Chapter 3, II, B. Rappel Check Spotter Position Prerequisites, 2.</td>
</tr>
<tr>
<td>3-3, Chapter 3, II, B. Rappel Check Spotter Position Prerequisites, 2. D. E.</td>
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**NROG Appendix N (ver. 1)**

**USFS Rappel Crew Status Report**

**Region:**

**Rappel Crew:**

**Base Manager:**

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<th>Total Personnel</th>
<th>Qualified Spotters</th>
<th>Trainee Spotters</th>
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<td>Rookies w/ Prior Rap Exp:</td>
<td>Avg/Max/Min Fire Exp (yr):</td>
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<td>Returned/Vet Employees:</td>
<td>PFT-PSE/Temp Ratio:</td>
<td>Rappel Exp/True Rookie Ratio:</td>
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**Information Sharing:**

**Primary Challenges** (infrastructure, hiring, staffing, retention, funding):

**NROG 15: (1) PFT 9, (1) PSE 8, (2) PSE 6/7, (4) PSE 5**

**NROG Min Org met per RAP HELICOPTER?** ☐ YES ☐ NO

**Objective:**

**Instructions:**

- Fill out two roster sheets if your program has multiple rappel aircraft
- Complete top section, pertinent crew roster sheet(s), and last page if necessary
- Change approved position tour as needed, i.e., the GS-8 on your crew is PFT
- The green sections below are associated with the NROG, 15-person minimum standard
- The gray sections are for crews that have approved positions above the NROG 15-person crew standard
- The crew roster table(s) may not fit your ORG perfectly, use the Information Sharing Box above as needed
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**Forest Service**
## Additional Rappel Qualified/Cross-Trained Positions:

Example: GS-11 Airbase Manager, Co-Located T1/T3 Helicopter Staff

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<td>Temp Firefighters GS-04</td>
<td>Temporary</td>
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Issue - Short-Term Recommendations – Solution Support

Reason(s) for not Meeting the 15-person Minimum Staffing Requirement (NROG/5700)
1. 
2. 
3. 
4. 

Staffing Plan for Current Fire Year, i.e., 7-day effectiveness will be accomplished through boosting, or 30/60/120 details, etc:
1. 
2. 
3. 
4. 

Staffing Assistance via Boost or Detail may be Needed in the Following Area:
1. 
2. 
3. 
4. 

NRWT & National Rappel Specialist Response:

| No Response/Action Necessary | Response/Action (ref below) |

Response Narrative:

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<th>Action Item</th>
<th>Assigned To</th>
<th>Report Date</th>
<th>Remarks</th>
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