

May 2003

APPENDIX B
MODEL SPECIFIC PROCEDURES

B-1



**AEROSPATIALE SA 315B (Lama) RAPPEL PROCEDURES WITH
“ROBERTS/GEO-SEIS” RAPPEL ANCHOR**

On Ground: Pre Rappel

1. Configure helicopter.

NOTE: The helicopter will be configured to meet the needs of the specific rappel mission. Left front (spotter’s) seat may be removed or reversed at the discretion of the program manager. If seat is reversed, headrest attachment shall be installed.

It is also permissible for rappellers to wear belly bags at the discretion of the program manager.

- A. Remove doors and all loose items from cabin and baskets.
 - B. Reverse or remove spotters seat.
 - C. Visually inspect rappel anchor (*See Chapter 3, Rappel Anchor Inspection*).
2. Loading/Boarding.
- A. Rappellers complete buddy check to include buddy's rope and genie.
 - B. Spotter oversees securing of cargo (*Refer to Cargo Deployment Procedures page B-4*).
 - C. Rappeller(s) approach aircraft and place rope bags on floor of helicopter. Right side rappeller completes equipment check on spotter. Ropes are attached to rear attach points of anchor, and snub strap to ropes, between 1st and 2nd swedge.
 - D. Rappellers connect genie to harness, make necessary adjustments, then lock off.

- E. The spotter then initiates the spotter check, one rappeller at a time, by starting with the rappeller on the pilot side of the aircraft and then moving to rappeller on the spotter side. When complete the spotter gives the thumbs up signal.
- F. The rappellers, in sequence, take their assigned seats, and fasten their seat belts. The spotter will ensure that each rope bag is secured in the aircraft.
- G. The spotter connects tether to approved attach point, displays harness, PPE, tether, and knife to rappellers and exchanges a thumbs up signal if all is OK.
- H. The spotter enters the aircraft, takes seat, fastens seat belt, and plugs into radio system. Rappeller(s) will note this and if okay thumbs-up signal is again exchanged.
- I. The spotter gives "O.K." to pilot to take off and reminds pilot if there is an external load attached.

In-Flight Operations

1. The Rappel

- A. Pilot flies a reconnaissance of the area to look for hazards and works with spotter in selecting an appropriate landing or rappel site.
- B. Pilot and spotter select rappel site and then consider alternate emergency site in the event that one or both rappellers need to tie off and be flown to the emergency site.
- C. Contact appropriate flight following authority (ATGS, HLCO, dispatch, etc.) prior to commencing the rappel sequence.
- D. Radio volume is adjusted, if necessary.
- E. Pilot announces, "*One minute out*".
- F. Activate hot mike. From this point on all spotter actions are verbalized to pilot.

NOTE: An OGE Power check is accomplished prior to entering rappel hover at an altitude comparable to the site or greater. A positive rate of climb must be established *without exceeding aircraft limitations*.

- G. If spotter's seat is removed, spotter receives pilot approval to move forward in aircraft.
- H. Helicopter is positioned over the designated rappel site with spotter assistance. Terminology should use pilot's perspective (*your side, my side, forward, back and up or down relative to altitude above the ground*).
- I. Pilot establishes hover, checks power, gives "O.K." to proceed.

NOTE: If using external cargo delivery, rappellers remain belted until cargo portion is complete. Refer to External Cargo Deployment Procedures page B-6.

- J. Spotter signals rappellers to undo seat belts.
- K. Spotter states "dropping rope(s)", pilot responds "O.K " or "No". IF pilot responds "No", spotter and pilot will reassess situation and take appropriate action. If O.K. spotter gives signal (*downward sweeping motion of arms with index finger extended*) to drop ropes(s) **inside of the skids**. (Spotter may elect to drop spotter side rope).
- L. Spotter checks that the ropes are free of knots and rope bag(s) is on the ground and informs pilot the "*ropes are on the ground*". Rappellers edge outwards to place outboard foot onto step.
- M. Spotter states "*rappellers to skids*", pilot responds "O.K " or "No". IF pilot responds "No", spotter and pilot will reassess situation and take appropriate action.
- N. If okay, spotter signals each rappeller (*locked hands*) to move into position on skid. Rappellers reach behind their back with inside hand grasping doorframe. Moving outside foot to step, turning to face inside. Inside foot crosses behind outside foot down to final position on skid. Outside foot is moved to center forward facing seat.
- O. Spotter states, "*sending rappellers,*" pilot responds "O.K " or "No". IF pilot responds "No", spotter and pilot will reassess situation and take appropriate action.

NOTE: If at any time the pilot (or spotter) indicates a problem, the spotter and pilot will reassess the situation and take appropriate action. This may include the spotter aborting the mission and signaling rappeller(s) back into the aircraft or merely delaying sending them.

- P. If okay, spotter signals rappellers to descend. (*palms down, sweeping motion*)
- Q. Rappellers then exit skids, unlock, and descend to the ground at a controlled rate. The spotter notifies the pilot of the position of the rappeller(s) from the aircraft to the ground.
- R. After reaching the ground, rappeller(s) disconnect from the rope and move to a safe area.
- S. Spotter advises the pilot "*rappellers clear*", disconnects safety snub strap and secures it, disconnects and drops the rope(s) and advises pilot "ropes on ground," and secures seat belts is necessary.
- T. Spotter remains in seat and advises pilot to depart or initiate the internal cargo procedure.
- U. Pilot departs rappel site, while spotter re-hooks seat belt.
- V. Radio returned to normal operational mode and flight following authority is informed that the rappel sequence has been completed. The helicopter should remain in the area until radio contact is established with rappellers.

NOTE: The spotter and pilot may elect to deploy one rappeller at a time for a variety of reasons. This is an acceptable practice. The National Helicopter Operations Specialist for Forest Service rappel operations must approve any variations in these procedures. DOI agencies shall receive approvals from their agencies' national aviation operations specialist prior to deviating from these procedures.

Cargo Deployment Procedures

There are two (2) cargo delivery methods for the AS-315 Lama. The two methods are floor internal cargo and floor external cargo.

Floor Internal Cargo

1. Pre Deployment

NOTE: Spotter Safety Checks as per Chapter 7, Section IV shall be followed.

- A. The pilot and spotter configure aircraft for mission by removing door(s) and securing loose items. Removal of front seat is optional.
- B. Spotter puts on harness, knife readily accessible.

- C. Visually inspect floor-mounted anchor. (*See Chapter 3, Rappel Anchor Inspection*)
- D. Secure cargo in helicopter.
- E. Secure harness tether to an approved attach point. If cargo mission is separate from rappeller deployment, spotter shall display PPE, harness and tether to pilot. Assure carabiners, figure 8 and letdown lines are on board. Enter aircraft and buckle seat belt.

2. Approach to Drop Site:

- A. Recon area for hazards and confirm deployment site with pilot.
- B. Identify and check alternate site.
- C. Rig letdown line through figure 8, attach figure 8 to positive locking steel carabiner and to floor anchor with carabiner. Then attach end of letdown line to positive locking steel carabiner on cargo and lock carabiner. Take up any additional slack. Inform pilot cargo is rigged.
- D. Spotter may elect to remain seat belted, unfasten seat belt, or move to rearward facing spotters seat.
- E. Inform ground personnel to stay clear of cargo during deployment.
- F. Inform flight following that the radio will be off frequency (if not already done).
- G. Activate hot mike. From this point on all spotter actions are verbalized to pilot.

3. Hover Position

- A. Communicate with pilot to position helicopter over deployment spot. Terminology should use pilot's perspective (*your side, my side, forward, back and up or down relative to altitude above the ground*).
- B. Spotter Checks power with pilot. Suggested verbiage to use when in hover over spot:

SPOTTER: *"How's Power?"*

PILOT: *"Power is good"*

SPOTTER: *"Ready To Deploy"*

PILOT: *"Go Ahead"*

CAUTION: Spotter shall not move cargo outside the aircraft until the pilot announces power is good.

4. Cargo Deployment

- A. Ease cargo out of door, lowering between fuselage and skid.
- B. Lower cargo with positive control of letdown line. Via hot mike, keep pilot informed of actions and progress of cargo descent:
 - *"Cargo out the door";*
 - *"Cargo halfway down";*
 - *"Cargo on ground, etc. "*
- C. When cargo is on ground, hold slack in line to prevent billowing (if deploying split load, attach cargo to letdown line and repeat steps A and B), unhook figure 8, remove figure 8 from letdown line, and secure in aircraft.
- D. Wrap excess letdown line around the accordion pack and drop pack to the ground.
- E. Inform pilot if more cargo is to be lowered with additional letdown line. Pilot will determine whether to hover or orbit area until cargo is ready for subsequent deployment. When cargo deployment is complete and rigging is clear of aircraft, inform pilot *"We're clear to fly away"*.

Floor External Cargo

1. Pre-Deployment Procedures

NOTE: Spotter Safety Checks as per Chapter 7, Section IV shall be followed.

- A. Spotter puts on harness, knife readily accessible.
- B. Attach cargo via cargo strap to swivel.
- C. Perform all appropriate hook checks.
- D. Attach swivel connected to cargo strap to helicopter belly hook.

NOTE: A swivel will be required with all external loads. The swivel attachment ring inside diameter must meet helicopter hook specifications.

- E. Attach the single hard loop end of breakaway strap to the top end of the swivel hardware.

- F. Rig letdown line through figure 8 and attach to positive locking steel carabiner on spotter's side forward attach point. Lock carabiner.
- G. Lock-off letdown line on figure 8.
- H. Attach positive locking steel carabiner on rigged letdown line to the velcro loop on the breakaway strap.
- I. Secure accordion pack and harness tether to approved attach point.
- J. Spotter performs final cargo letdown system inspection. Displays harness tether attachments to rappellers for *thumbs up*. If cargo mission is separate from rappeller deployment, spotter shall display PPE, harness and tether to pilot.
- K. Spotter fastens seat belt. Gives OK to pilot to depart and reminds pilot if there is an external load attached.

NOTE: Maintain positive control of letdown line while enroute to the deployment site.

2. Approach to Drop Site

- A. Recon area for hazards and confirm deployment site with pilot.
- B. Identify and check alternate site.
- C. Inform any ground personnel to stay clear of cargo during deployment
- D. Inform flight following that the radio will be off frequency (if not already done).
- E. Activate hot mike. From this point on all spotter actions are verbalized to pilot.

3. Hover Position

- A. Communicate with pilot to position helicopter over deployment spot. Terminology should use pilot's perspective (*your side, my side, forward, back and up or down relative to altitude above the ground*).
- B. Spotter Checks power with pilot. Suggested verbiage to use when in hover over spot:

SPOTTER: *"How's Power?"*

PILOT: *"Power is good"*

- C. If power is good, spotter initiates cargo hook-up

4. Cargo Hook-Up and Deployment

- A. **If cargo is deployed with rappellers on board**, spotter side rappeller turns body to face outward.
- B. Spotter attaches letdown line to hard loop on breakaway strap with positive locking steel carabiner. Lock carabiner.
- C. Spotter unlocks figure 8 and remove slack in line to allow for a smooth deployment.
- D. Spotter manually places carabiner over doorsill of helicopter, then informs pilot that cargo is rigged and ready for deployment. Spotter confirms power once more with pilot.
- E. Pilot gives a three (3) count and releases cargo from belly hook.

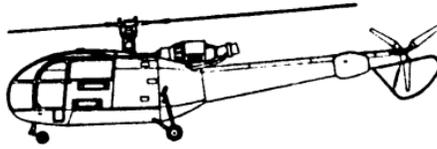
NOTE: Maintain a tight letdown line at all times. Do not allow unarrested descent.

- F. Via hot mike, keep pilot informed of actions and progress of cargo descent:
 - *"Cargo halfway down";*
 - *"Cargo on ground, etc. "*
- G. When cargo reaches ground, hold slack in rope and prevent billowing of line while unhooking Figure 8.
- H. Secure Figure 8 inside aircraft.
- I. Accordion pack is unhooked. Excess line is wrapped around pack to eliminate the potential for excess line pulling out when dropped.
- J. After the accordion pack and line are clear of the helicopter, the spotter communicates to the pilot that the cargo is clear. **If cargo is deployed with rappellers on board**, spotter side rappeller returns feet to forward position.
- K. Pilot may remain in hover or depart and return to hover to deploy rappellers.
- L. Spotter will proceed with rappeller deployment.

- M. After completion of mission, re-establish communications with flight following.

NOTE: When external cargo procedures are complete, spotter may then deploy rappellers. Refer to In Flight Operations page B-2.

B-2



AEROSPATIALE SA316-B WITH OVERHEAD RAPPEL ANCHOR

On-Ground: Pre-Rappel

1. Configure Helicopter.

NOTE: The helicopter will be configured to meet the needs of the specific rappel mission. It is also permissible for rappellers to wear belly bags at the discretion of the program manager.

- A. Rear doors shall be opened and locked back, front doors shall be removed. Remove all loose items from cabin and baskets, secure bungee cords to rear of, or inside of baskets.
- B. Remove left front seat if installed. Rappel operations shall be conducted using center seat installed. Install fuel shutoff guard if necessary.
- C. Visually inspect overhead and floor mounted anchors (*See Chapter 3, Rappel Anchor Inspection*).

2. Loading/Boarding

- A. Rappellers complete buddy check to include buddy's rope and genie. Rappeller(s) approach aircraft and place rope bags on floor of helicopter. Right side rappeller completes equipment check on spotter.
- B. If using external cargo delivery method, spotter rigs external cargo. (*Refer to Cargo Deployment Procedures page B-14.*)
- C. Spotter attaches ropes to anchor with locking carabiners and connects safety snub straps between ropes and anchor with locking carabiners.
- D. Rappellers connect descent device to harness and lock-off while in pre-descent position on the steps.
- E. Spotter initiates equipment checks one rappeller at a time starting with pilot side. Spotter inspects the rappel anchor, attachments, rope, snub strap, descent device, Forgecraft hook, and tri-link. Spotter inspects

rappellers PPE (helmet, eye protection, clothing, gloves), harness (stitching and hardware), and ensures the safety knife is readily accessible and secure.

- F. If all is correct, *thumbs up* are exchanged by rappeller and spotter, then rappeller enters aircraft and buckles in. If all equipment is not correct, start the inspection over.
- G. Spotter double checks seat belt and ensures rope bag is positioned on seat, between rappellers.
- H. Repeat process with second rappeller.
- I. Spotter boards aircraft, attaches spotter tether to hard point, then displays his/her tether to and receives (*thumbs up*) signal from both rappellers.
- J. Spotter fastens seat belt. Gives OK to pilot to depart and reminds pilot if there is an external load on the hook.

In-Flight Operations

1. The Rappel

- A. Pilot flies a reconnaissance of the area to look for hazards and works with spotter in selecting an appropriate landing or rappel site.
- B. Pilot and spotter select rappel site and then consider alternate emergency site in the event that one or both rappellers need to tie off and be flown to the emergency site.
- C. Contact appropriate flight following authority (ATGS, HLCO, dispatch, etc.) prior to commencing the rappel sequence.
- D. Radio volume is adjusted, if necessary.
- E. Pilot announces, "*One minute out*".
- F. Activate hot mike. From this point on all spotter actions are verbalized to pilot.

NOTE: An OGE Power check is accomplished prior to entering rappel hover at an altitude comparable to the site or greater. A positive rate of climb must be established *without exceeding aircraft limitations*.

- G. Helicopter is positioned over the designated rappel site with spotter assistance. Terminology should use pilot's perspective (*your side, my side, forward, back and up and down relative to altitude above the ground*).
- H. Pilot establishes hover, checks power, gives "O.K." to proceed.

NOTE: If using external cargo delivery, rappellers remain belted until cargo portion is complete. Refer to Cargo Deployment Procedures page B-14.

- I. Upon confirmation of good power, spotter directs rappellers to unbuckle seat belts.
- J. Spotter completes visual systems check of rappel hardware. Spotter states "*dropping rope(s)*", pilot responds "O.K." or "No". If pilot responds "No", spotter and pilot will reassess situation and take appropriate action.
- K. If okay, spotter signals to drop rope bags (*downward sweeping motion of arms with index fingers extended*). Spotter checks that the ropes are free of knots and rope bag(s) are on the ground. Pilot side rappeller gives spotter "*thumbs up*" indicating their rope is O.K. Spotter informs pilot "*ropes are on the ground*".
- L. Spotter states, "*sending rappellers to the steps*", pilot responds "O.K." or "No". IF pilot responds "No", spotter and pilot will reassess situation and take appropriate action.
- M. If okay, spotter signals each rappeller (*locked hands*) to move to the step(s).
- N. Rappellers exit aircraft facing each other with their genies in their left hand and using the overhead rappel anchor in their right hand for support. They place one foot on the step and the other foot on the basket edge or foot peg making sure that the rope is on their right side. Once outside the rappellers release the rappel anchor and lean back with straight legs. Rappeller(s) will have genie in the left hand with the rope grasped in the right hand near the lock-off.
- O. Spotter informs pilot of rappeller movements, informing pilot when rappeller(s) are in position on the step(s). Once the rappeller is in position on skid, both spotter and rappeller must "clear rope" by checking entire rope from anchor to ground, looking for any knots, rope hang-ups, obstructions in the descent path and that rope bags are on the ground. IF pilot responds "*Power O.K.*", spotter completes visual systems check. IF pilot responds "No," spotter signals rappeller(s) back into cabin (*raised clenched fists, bent elbows moving together*). Rappeller(s) return to their seat and fasten seat belt(s).

- P. Spotter states, "*sending rappellers,*" pilot responds "*O.K*" or "*No*". IF pilot responds "*No*", spotter and pilot will reassess situation and take appropriate action.

NOTE: If at any time the pilot (or spotter) indicates a problem, the spotter and pilot will reassess the situation and take appropriate action. This may include the spotter aborting the mission and signaling rappeller(s) back into the aircraft or merely delaying sending them.

- Q. If okay, spotter signals rappeller(s) to descend (*palms down sweeping motion*).
- R. Rappellers then undo lock-off and smoothly feed rope into the genie until attaining an almost inverted position with legs continuing to be straight.
- S. Rappellers then slip off steps and start feeding in a smooth, but deliberate motion. Rappellers descend to the ground at a controlled rate. The spotter notifies the pilot of the position of the rappeller(s) from the aircraft to the ground.
- T. After reaching the ground, rappeller(s) disconnect from the rope and move to a safe area.
- U. Spotter advises the pilot "rappellers clear," disconnects safety snub strap and secures it, disconnects and drops the left rappel rope, then informs pilot "coming behind you" and climbs on to rear seat to ensure visibility out the door and repeats process with right rope advising pilot "ropes on ground."
- V. Spotter then slides over to the center left seat and advises the pilot to depart or initiate the internal cargo procedure.
- W. Pilot departs rappel site, while spotter rehooks seat belt.
- X. Radio returned to normal operational mode and flight following authority is informed that the rappel sequence has been completed. The helicopter should remain in the area until radio contact is established with rappellers.

NOTE: The spotter and pilot may elect to deploy one rappeller at a time for a variety of reasons. This is an acceptable practice. The National Helicopter Operations Specialist for Forest Service rappel operations must approve any variations in these procedures. DOI agencies shall receive approvals from their agencies' national aviation operations specialist prior to deviating from these procedures.

Cargo Deployment Procedures (*Floor Mounted Anchor*)

1. Pre Deployment

NOTE: Spotter Safety Checks as per Chapter 7, Section IV shall be followed.

- A. Rear doors shall be opened and locked back, front doors shall be removed. Remove all loose items from cabin and baskets, secure bungee cords to rear of or inside of baskets.
- B. Remove left front seat if installed. Cargo operations shall be conducted with center seat installed. Install fuel shutoff guard if necessary.
- C. Spotter puts on harness, knife readily available.
- D. Visually inspect floor-mounted anchor. (*See Chapter 3, Rappel Anchor Inspection*).
- E. Attach cargo via cargo strap to swivel.
- F. Perform all appropriate hook checks.
- G. Attach swivel connected to cargo strap to helicopter belly hook.

NOTE: A swivel will be required with all external loads. The swivel attachment ring inside diameter must meet helicopter hook specifications.

- H. Attach single hard loop end of breakaway strap to the top end of the swivel hardware.
- I. Rig letdown line through figure 8 and attach to the floor anchor with two (2) positive locking steel carabiners in line to prevent side load.
- J. Lock off letdown line on figure 8.
- K. Attach positive locking steel carabiner on rigged letdown line to the velcro loop on the breakaway strap.
- L. Spotter performs final cargo letdown system inspection.
- M. Secure accordion pack and harness tether to approved attachment point.
- N. Spotter fastens seat belt and gives pilot the OK to depart, and reminds him/her of the external load.

2. Approach to Drop Site

- A. Recon area for hazards and confirm deployment site with pilot.
- B. Identify and check alternate site.
- C. Inform ground personnel to stay clear of cargo during deployment.
- D. Inform flight following that the radio will be off frequency (if not already done).
- E. Activate hot mike. From this point on all spotter actions are verbalized to pilot.
- F. Spotter moves to floor position.

3. Hover Position

- A. Communicate with pilot to position helicopter over deployment spot. Terminology should use pilot's perspective (*your side, my side, forward, back and up or down relative to altitude above the ground*).
- B. Spotter Checks power with pilot. Suggested verbiage to use when in hover over spot.

SPOTTER: *"How's Power?"*
PILOT: *"Power is good"*
- C. If power is good, spotter initiates cargo hook-up.

4. Cargo Hook Up and Deployment.

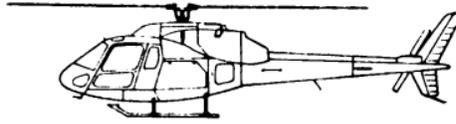
- A. Upon confirmation of power, spotter prepares cargo by connecting soft loop of breakaway strap to carabiner on letdown line.
- B. Unlock let down line from figure 8 and feed carabiner past the step.
- C. Spotter informs pilot that load is ready and requests another power check.
- D. If power is "O.K.", the pilot proceeds to give three (3) count and release the load from the cargo hook.

NOTE: Maintain a tight letdown at all times. Do not allow unarrested descent.

- E. Via hot mike, keep pilot informed of actions and progress of cargo descent:
 - *"Cargo halfway down";*
 - *"Cargo on ground, etc. "*
- F. When cargo reaches ground, hold slack in line to prevent billowing while unhooking Figure 8.
- G. Secure Figure 8 inside aircraft.
- H. Unhook accordion pack and wrap excess line around pack to eliminate the potential for excess line pulling out when dropped.
- I. After the accordion pack and line are clear of the helicopter, the spotter communicates to the pilot that the line is clear.
- J. Pilot may remain in hover or depart and return to hover to deploy rappellers.
- K. Spotter will fasten seat belt and proceed with deploying rappellers.
- L. After completion of mission, re-establish communications with flight following.

NOTE: When external cargo procedures are complete, spotter may then deploy rappellers. Refer to In Flight Operations pages B-11.

B-3



EUROCOPTERS AS-350 SERIES (A-Star) RAPPEL PROCEDURES

On Ground: Pre-Rappel

1. Configure helicopter.

NOTE: The helicopter will be configured to meet the needs of the specific rappel mission. It is also permissible for rappellers to wear belly bags at the discretion of the program manager.

The overhead outside anchor and the floor inside anchor are the only acceptable anchors in use.

- A. The pilot and spotter configure aircraft, remove loose items.
 - B. The spotter visually inspects rappel anchor (*see Chapter 3, Rappel Anchor Inspection*). The overhead anchor is rigged by attaching the rope to the **inner** attach point with one steel carabiner. One end of the snub strap is attached to the rope and the other to the **aft** attachment point. The floor anchor is rigged by attaching rope to the *aft left and right* attachment points with locking steel carabiners. The snub strap is attached between the first and second swedges of the two rope ends. (For single rappel, the free end of the snub strap will be secured to the opposite side of the rappel anchor.) Attachment points will hereafter be referred to as approved attach points.
 - C. Rappellers begin gearing up for the rappel.
2. Loading/Boarding
 - A. Rappellers complete buddy check to include buddy's rope and genie.
 - B. Spotter oversees securing of cargo (*Refer to Cargo Deployment Procedures page B-20*).
 - C. The rappellers then go to their designated side of the aircraft and hook into the sky genie.

- D. The rappellers adjust rope slack, tension and genie placement by assuming the rappel stance on the skid.
- E. The rappellers stand by for the spotter check. Right side rappeller completes equipment check on spotter.
- F. The spotter then initiates the spotter check, one rappeller at a time, by starting with the rappeller on the pilot side of the aircraft and then moving to rappeller on the spotter side. When complete the spotter gives the thumbs up signal.
- G. The rappellers, in sequence, take their assigned seats, and fasten their seat belts. The spotter will ensure that each rope bag is secured in the aircraft
- H. The spotter connects to the spotter tether, displays harness, PPE, tether, and knife to rappellers and exchanges a thumbs up signal if all is OK.
- I. The spotter enters the aircraft, takes seat, fastens seat belt, and plugs into radio system. Rappeller(s) will note this and if okay thumbs-up signal is again exchanged.
- J. The spotter gives "O.K." to pilot to take off and reminds pilot if there is an external load attached.

In-Flight Operations

1. The Rappel

- A. Pilot flies a reconnaissance of the area to look for hazards and works with spotter in selecting an appropriate landing or rappel site.
- B. Pilot and spotter select rappel site and then consider alternate emergency site in the event that one or both rappellers need to tie off and be flown to the emergency site.
- C. Contact appropriate flight following authority (ATGS, HLCO, dispatch, etc.) prior to commencing the rappel sequence.
- D. Radio volume is adjusted, if necessary.
- E. Pilot announces, "*One minute out*".
- F. Activate hot mike. From this point on all spotter actions are verbalized to pilot.

NOTE: An OGE Power check is accomplished prior to entering rappel hover at an altitude comparable to the site or greater. A positive rate of climb must be established *without exceeding aircraft limitations*.

- G. Spotter then receives pilot approval to move forward in aircraft.
- H. Helicopter is positioned over the designated rappel site with spotter assistance. Terminology should use pilot's perspective (*your side, my side, forward, back, and up or down relative to altitude above the ground*).
- I. Pilot establishes hover, checks power, gives "O.K." to proceed.

NOTE: If using external cargo delivery, rappellers remain belted until cargo portion is complete. Refer to Cargo Deployment Procedures page B-20.

- J. Spotter signals rappellers to undo seat belts.
- K. Spotter states "*dropping rope(s)*", pilot responds "O.K." or "No". IF pilot responds "No", spotter and pilot will reassess situation and take appropriate action. If pilot responds O.K., spotter gives signal (*downward sweeping motion of arms with index finger extended*) to drop rope(s) out, over the skid. (Spotter may elect to drop spotter side rope).
- L. Spotter checks to ensure the rope(s) are free of knots and the rope bag(s) are on the ground. If okay, spotter informs the pilot that "*ropes are on the ground*"
- M. Spotter states "*rappellers to skids*" pilot responds "O.K." or "No". IF pilot responds "No", spotter and pilot will reassess situation and take appropriate action.
- N. If O.K., spotter signals each rappeller (*locked hands*) to move into position on skid. Rappeller exits to skid by placing outboard foot on step, backing out, and placing other foot to skid, then following to the skid with the first foot. Rappeller remains in standing position, leaning back with weight supported by anchored rope. Once the rappeller is in position on skid, both spotter and rappeller must "clear rope" by checking entire rope from anchor to ground, looking for any knots, rope hang-ups, obstructions in the descent path and that rope bags are on the ground.
- O. Spotter states, "sending rappeller(s)", pilot responds "O.K." or "No". IF pilot responds "No", spotter and pilot will reassess situation and take appropriate action.

NOTE: If at any time the pilot (or spotter) indicates a problem, the spotter and pilot will reassess the situation and take appropriate action. This may

include the spotter aborting the mission and signaling rappeller(s) back into the aircraft or merely delaying sending them.

- P. If O.K., spotter signals rappellers to descend (*palm(s) down in a sweeping motion*).

NOTE: Approved EXIT is an *inverted exit*.

- Q. Rappellers then undo lock-off and smoothly feed rope into the genie until attaining an almost inverted position with legs continuing to be straight.
- R. Rappellers then slip off skids and start feeding in a smooth, but deliberate motion. Rappellers descend to the ground at a controlled rate. The spotter notifies the pilot of the position of the rappeller(s) from the aircraft to the ground.
- S. After reaching the ground, rappeller(s) disconnect from the rope and move to a safe area
- T. Spotter advises the pilot "*rappellers clear,*" disconnects safety snub strap and secures it, disconnects and drops the rappel rope(s), advises pilot "*ropes on ground,*" and secures seat belts if necessary.
- U. Spotter then moves to seat and advises the pilot to depart or initiate the internal cargo procedure.
- V. Pilot departs rappel site, while spotter fastens seat belt.
- W. Radio returned to normal operational mode and flight following authority is informed that the rappel sequence has been completed. The helicopter should remain in the area until radio contact is established with rappellers.

NOTE: The spotter and pilot may elect to deploy one rappeller at a time for a variety of reasons. This is an acceptable practice. The National Helicopter Operations Specialist for Forest Service rappel operations must approve any variations in these procedures. DOI agencies shall receive approvals from their agencies' national aviation operations specialist prior to deviating from these procedures.

Cargo Deployment Procedures

There are two (2) cargo delivery methods for the AS-350 A-Star Series. The two methods are internal cargo and external cargo. The approved attach point for the figure 8 on the overhead anchor is the outside attach point; on the floor anchor, the approved attach point is the forward right or left attach point. Attachment points will hereafter be referred to as approved attach points.

Internal Cargo

1. Pre Deployment

NOTE: Spotter Safety Checks as per Chapter 7, Section IV shall be followed.

- A. The pilot and spotter configure aircraft for mission removing door(s) and securing loose items. Removal of front seat is optional.
- B. Spotter puts on harness, knife readily accessible.
- C. Visually inspect anchor. *(See Chapter 3, Rappel Anchor Inspection).*
- D. Secure cargo in helicopter.
- E. Secure harness tether to an approved attachment point with positive locking steel carabiner. Spotter shall display PPE, harness and tether, and knife to rappellers and/or pilot to confirm all is properly worn and rigged.
- F. Assure carabiners, figure 8, and letdown lines are on board. Enter aircraft and buckle seat belt.

2. Approach to Drop Site:

- A. Recon area for hazards and confirm deployment site with pilot.
- B. Identify and check alternate site.
- C. Rig letdown line through figure 8. Attach figure 8 to positive locking steel carabiner at the approved attach point. Then attach end of letdown line to positive locking steel carabiner on cargo and lock carabiner. Take up any additional slack. Inform pilot cargo is rigged.
- D. Spotter may elect to remain seat belted, unfasten seat belt, or move to rearward facing spotter position.
- E. Inform ground personnel to stay clear of cargo during deployment.
- F. Contact appropriate flight following authority (ATGS, HLCO, dispatch, etc.) prior to commencing the rappel sequence.
- G. Activate hot mike. From this point on all spotter actions are verbalized to pilot.

3. Hover Position

- A. Communicate with pilot to position helicopter over deployment spot. Terminology should use pilot's perspective (*your side, my side, forward, back and up or down relative to altitude above the ground*).
- B. Spotter Checks power with pilot. Suggested verbiage to use when in hover over spot:

SPOTTER: *"How's Power?"*

PILOT: *"Power is good"*

SPOTTER: *"Ready To Deploy"*

PILOT: *"Go Ahead"*

CAUTION: Spotter shall not move cargo outside the aircraft until the pilot announces power is good.

4. Cargo Deployment

- A. Ease cargo out of door, lowering outside of skid.
- B. Begin lowering cargo with positive control of letdown line. Via hot mike, keep pilot informed of actions and progress of cargo descent:
 - *"Cargo out the door";*
 - *"Cargo halfway down";*
 - *"Cargo on ground, etc. "*
- C. When cargo is on ground, hold slack in line to prevent billowing (if deploying split load, attach cargo to letdown line and repeat steps A and B), unhook figure 8, remove figure 8 from letdown line, and secure figure 8 in aircraft.
- D. Wrap excess letdown line around the accordion pack and drop pack to the ground.
- E. Inform pilot if more cargo is to be lowered with additional letdown line. Pilot will determine whether to hover or orbit area until cargo is ready for subsequent deployment. When cargo deployment is complete and rigging is clear of aircraft, inform pilot *"We're clear to fly away"*.

External Cargo

1. Pre-Deployment Procedures

NOTE: Spotter Safety Checks as per Chapter 7, Section IV shall be followed.

- A. Spotter puts on harness, knife readily accessible.
- B. Attach cargo via cargo strap to swivel.
- C. Perform all appropriate hook checks.
- D. Attach swivel connected to cargo strap to helicopter belly hook.

NOTE: A swivel will be required with all external loads. The swivel attachment ring inside diameter must meet helicopter hook specifications.

- E. Attach the single hard loop end of breakaway strap to the top end of the swivel hardware.
- F. Rig letdown line through figure 8 and attach to positive locking steel carabiner at *approved* attach point on anchor. Lock carabiner.
- G. Lock-off letdown line on figure 8.
- H. Attach positive locking steel carabiner on rigged letdown line to the velcro loop on the breakaway strap.
- I. Secure accordion pack and harness tether to approved attachment point.
- J. Spotter performs final cargo letdown system inspection. Displays harness tether attachments to rappellers for *thumbs up*.
- K. Spotter fastens seat belt. Gives OK to pilot to depart and reminds pilot if there is an external load on the hook.

NOTE: Maintain positive control of letdown line enroute to the deployment site.

2. Approach to Drop Site

- A. Recon area for hazards and confirm deployment site with pilot.
- B. Identify and check alternate site.
- C. Inform any ground personnel to stay clear of cargo during deployment.
- D. Contact appropriate flight following authority (ATGS, HLCO, dispatch, etc.) prior to commencing the letdown sequence.

- E. Activate hot mike. From this point on all spotter actions are verbalized to pilot.

3. Hover Position

- A. Communicate with pilot to position helicopter over deployment spot. Terminology should use pilot's perspective (*your side, my side, forward, back and up or down relative to altitude above the ground*).
- B. Spotter Checks power with pilot. Suggested verbiage to use when in hover over spot:

SPOTTER: *"How's power?"*

PILOT: *"Power is good"*

- C. If power is good, spotter initiates cargo hook-up

4. Cargo Hook-Up and Deployment

- A. Attach letdown line to hard loop on breakaway strap with positive locking steel carabiner. Lock carabiner.
- B. Unlock figure 8 and remove slack in line to allow for a smooth deployment.
- C. Spotter informs pilot that cargo is rigged and ready for deployment. Spotter confirms power once more with pilot.
- D. Pilot gives a three (3) count and releases cargo from belly hook.

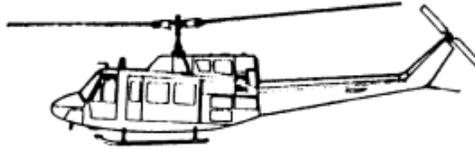
NOTE: Maintain a tight letdown line at all times. Do not allow unarrested descent.

- E. Via hot mike, keep pilot informed of actions and progress of cargo descent:
 - *"Cargo halfway down";*
 - *"Cargo on ground, etc. "*
- F. When cargo reaches ground, hold slack in rope and prevent billowing of line while unhooking Figure 8.
- G. Secure Figure 8 inside aircraft.
- H. Unhook accordion pack and wrap excess line around pack to eliminate the potential for excess line pulling out when dropped.

- I. After the accordion pack and line are clear of the helicopter, the spotter communicates to the pilot that the cargo is clear.
- J. Pilot may remain in hover or depart and return to hover to deploy rappellers.
- K. Spotter may proceed with rappeller deployment, or return to seat and fasten seat belt, if applicable.
- L. After completion of mission, re-establish communications with flight following.

NOTE: When cargo procedures are complete, spotter may then deploy rappellers. Refer to In Flight Operations page B-18.

B-4



***BELL 205/212/214B/412 RAPPEL PROCEDURES WITH
OVERHEAD RAPPEL ANCHOR***

On Ground: Pre-Rappel

1. Configure helicopter.

NOTE: The helicopter will be configured to meet the needs of the specific rappel mission. This may include combinations of forward facing, aft facing or well seating as dictated by mission requirements. It is also permissible for rappellers to wear belly bags at the discretion of the program manager.

- A. Visually inspect overhead rappel anchor, door brackets, safety snub and rappeller gunner straps (*See Chapter 3, Rappel Anchor Inspection*). This will include ensuring that gunner straps are adjusted for proper length to allow access to doorway and genie(s), but insufficient length to allow egress from the aircraft.
 - B. Spotter oversees loading of cargo, with adequate letdown gear. (*Refer to Cargo Deployment Procedures page B-30*).
 - C. Attach rope(s) to anchor and attach safety snub strap to rope(s). For single side operation free end of snub strap will be secured to the off or opposite side of the rappel anchor.
 - D. Inspect descent devices.
2. Loading/Boarding
- A. Rappellers complete buddy check. The rope(s) and genie(s) are pre-rigged for installation in the aircraft.

- B. Rappellers organize into proper rappel order and prepare to board the aircraft. First rappeller completes equipment check on Spotter.
- C. Spotter initiates spotter's checks of rappellers, one rappeller at a time.
- D. When all checks are completed both the spotter and rappeller exchange a "thumbs up".
- E. Repeat process with each rappeller.
- F. Rappeller boards aircraft, takes assigned seat, attaches gunner strap around torso above Forgecraft hook, and fastens seat belt around waist below Forgecraft hook
- G. While boarding aircraft, rappellers shall visually inspect rigged genie(s), rope attachment, and safety snub strap.
- H. Spotter confirms rappellers' seat belts and gunner straps are fastened correctly.
- I. With tether attached to approved attach point, spotter displays his/her tether, tether attachment, PPE, harness, knife, and commo, and then receives "thumbs up" confirmation from rappellers.

3. In-Flight Operations

1. The Rappel

- A. Pilot flies a reconnaissance of the area to look for hazards and works with spotter in selecting an appropriate landing or rappel site.
- B. Pilot and spotter select rappel site and then consider alternate emergency site in the event that one or both rappellers need to tie off and be flown to the emergency site.
- C. Contact appropriate flight following authority (ATGS, HLCO, dispatch, etc.) prior to commencing the rappel sequence.
- D. Radio volume is adjusted, if necessary.
- E. Pilot announces, "One minute out".
- F. Spotter removes seat belt and moves into position.

- G. On pilot approval spotter will slide door open, if double door operation have designated rappeller open other door upon receiving hand signal (*horizontal sweeping arm motion toward the rear of the aircraft*).
- H. Spotter designates rappellers to be deployed if less than full load is to be deployed.
- I. Activate hot mike. From this point on all spotter actions are verbalized to pilot.

NOTE: An OGE Power check is accomplished prior to entering rappel hover at an altitude comparable to the site or greater. A positive rate of climb must be established *without exceeding aircraft limitations*.

- J. Pilot positions helicopter over the designated rappel site, with spotter assistance. Terminology should use pilot's perspective (*your side, my side, forward, back, and up or down relative to altitude above the ground*). Allow sufficient hover height above canopy to facilitate multiple rappellers.
- K. Pilot establishes hover, checks power, gives "O.K." to proceed.

NOTE: Internal cargo may be delivered at this time, rappellers shall remain in seat belts until cargo portion complete. Refer to Cargo Deployment Procedures page B-30.

- L. Spotter states "*dropping rope*", pilot responds "O.K." or "No". IF pilot responds "No", spotter and pilot will reassess situation and take appropriate action.
- M. Spotter drops rope bag and ensures it is free of knots and rope bag is on the ground. In double door operation spotter will give designated rappeller on the opposite side of the aircraft signal to drop rope (*downward sweeping motion of arm with index finger extended*).
- N. Spotter states "*starting rappeller(s)*", pilot responds "O.K." or "No". IF pilot responds "No", spotter and pilot will reassess situation and take appropriate action.

NOTE: If at any time the pilot (or spotter) indicates a problem, the spotter and pilot will reassess the situation and take appropriate action. *This may include the spotter aborting the mission and signaling rappeller(s) back into the aircraft or merely delaying sending them.*

- O. Spotter signals individual rappeller(s) with remove seat belt signal. Rappeller(s) remove seat belt and move into pre-rappel position.

Rappeller(s) grasp and attach genie to Forgecraft hook and lock-off (*spotter may assist*). The spotter does a visual inspection of each rappeller's hook-up and lock-off, *ensuring rappellers right hand is on gunner strap release*. Spotter signals approval of hook-up and lock-off by giving rappeller(s) locked hands signal; upon receipt of locked hands signal each rappeller detaches gunner strap and moves into position onto the skid(s).

NOTE: Spotter will ensure that rappeller properly detaches gunner strap.

- P. Spotter informs pilot of rappeller movements, informing pilot when rappeller(s) are in pre-rappel position on the skid(s). Once the rappeller is in position on skid, both spotter and rappeller must "clear rope" by checking entire rope from anchor to ground, looking for any knots, rope hang-ups, obstructions in the descent path and that rope bags are on the ground. IF pilot responds "*power O.K.*", spotter completes visual equipment check. IF pilot responds "*No*", spotter signals rappeller(s) back into cabin (*raised clenched fist, bent elbows moving together*). *Rappeller(s) returns to their seat and fastens seat belt*).
- Q. Spotter states, "sending rappeller(s)", pilot responds "*O.K.*" or "*No*". IF pilot responds "*No*", spotter and pilot will reassess situation and take appropriate action.

NOTE: If at any time the pilot (or spotter) indicates a problem, the spotter and pilot will reassess the situation and take appropriate action. This may include the spotter aborting the mission and signaling rappeller(s) back into the aircraft or merely delaying sending them.

- R. If okay, spotter signals rappellers to descend (*palm(s) down in a sweeping motion*).
- S. Rappeller(s) will then unlock, exit skid(s), and descend to ground at a controlled descent rate. The spotter notifies the pilot of the position of the rappeller(s) from the aircraft to the ground.
- T. After reaching the ground, rappeller(s) disconnects from rope and moves to a safe area.
- U. Spotter confirms genie is on ground and directs pilot to lower aircraft as necessary.
- V. Spotter advises the pilot "rappeller(s) clear", repeats process as necessary. When complete, spotter drops rope(s) and advises pilot "rope(s) on ground".

- W. The spotter advises the pilot to depart or initiate the internal cargo procedure.
- X. Pilot departs rappel site, while spotter closes door(s) and rehooks seat belt.
- Y. Radio returned to normal operational mode and flight following authority is informed that rappel sequence has been completed. The helicopter should remain in the area until radio contact is established with rappellers.

NOTE: The spotter and pilot may elect to deploy one rappeller at a time for a variety of reasons. This is an acceptable practice. The National Helicopter Operations Specialist for Forest Service rappel operations must approve any variations in these procedures. DOI agencies shall receive approvals from their agencies' national aviation operations specialist prior to deviating from these procedures.

NOTE: If helicopter is to be configured in flight after deploying a partial load of rappellers, remaining rappellers shall visually inspect rigged genie(s), rope attachment, and safety snub strap prior to commencing rappel operation.

Cargo Deployment Procedures

For the Bell 212/214B/412/205 only internal cargo deployment procedures have been developed and approved at this time.

1. Pre Deployment

NOTE: Spotter Safety Checks as per Chapter 7, Section IV shall be followed.

- A. Spotter puts on harness, knife readily accessible.
- B. Rig load(s) with carabiner; secure cargo in ship;
- C. Rig Figure 8 and secure;
 - 1) Carabiner is placed in rear slot of door bracket
 - 2) Use one (1) carabiner with the figure 8.

NOTE: Figure 8 should be rigged to prevent crossing of letdown line and unintentional line abrasion.

3) Secure accordion pack and harness tether to an approved attach point.

4) Do verbal check with pilot: (See note at bottom of B-32)

- *“Carabiners locked”;*
- *“Spotter safety tether and seat belt are secure”;*
- *“Knife is accessible”;*

- *“Accordion pack is secure”*;
- *“Cargo is secure”*;

2. Approach to Drop Site:

- A. Recon area for hazards and confirm deployment site with pilot.
- B. Identify and check alternate site.
- C. On pilot’s concurrence unbuckle seat belt and open door.
- D. Inform ground personnel to stay clear while deploying cargo.
- E. Inform flight following that radio will be off frequency (if not already done).
- F. Activate hot mike. From this point on all spotter actions are verbalized to pilot.

3. Hover Position

- A. Communicate with pilot to position helicopter over deployment spot. Terminology should use pilot’s perspective (*your side, my side, forward, back and up or down relative to altitude above the ground*)
- B. Spotter checks power with pilot. Suggested verbiage to use when in hover over spot.

SPOTTER: *"How's Power?"*

PILOT: *"Power is good"*

SPOTTER: *"Ready To Deploy"*

PILOT: *"Go Ahead"*

CAUTION: Spotter shall not move cargo outside the aircraft until the pilot announces power is OK.

4. Cargo Deployment

- A. Ease cargo out of door, and hold out away from skid/step. Via hot mike, keep pilot informed of actions:
 - *"Cargo out the door"*;
 - *"Cargo halfway down"*;
 - *"Cargo on ground, etc. "*

- B. Personnel on the ground shall stay clear and maintain visual contact with the aircraft and cargo being lowered.
- C. When cargo is on ground, hold slack in line to prevent billowing (if deploying split load, attach cargo to letdown line and repeat steps a and b), unhook figure 8, remove figure 8 from letdown line, and secure figure 8 in aircraft.
- D. Wrap excess letdown line around the accordion pack and drop pack to the ground.
- E. Inform pilot if more cargo is to be lowered with additional letdown line. Pilot will determine whether to hover or orbit area until cargo is ready for subsequent deployment. When cargo deployment is complete and rigging is clear of aircraft, inform pilot “*We’re clear to fly away*”.

NOTE: Figure 8 may be rigged and hung on bracket in flight.

NOTE: IF RAPPELLERS ARE DELIVERED BEFORE CARGO THEN THE SEQUENCE OF EVENTS WILL BE ADJUSTED ACCORDINGLY TO REFLECT THIS (*i.e. items accomplished in the deployment of rappellers do not need to be repeated*).

B-5



BELL-206, L-SERIES RAPPEL PROCEDURES WITH USDA RAPPEL ANCHOR. STC #SH 4547NM

On-Ground: Pre-Rappel

1. Configure helicopter.

NOTE: The helicopter will be configured to meet the needs of the specific rappel mission. It is also permissible for rappellers to wear belly bags at the discretion of the program manager.

- A. Rear doors removed, front doors and litter door removed at pilots and spotters discretion, loose items removed from rear seat area, secure all seat belts.
 - B. Spotter visually inspects rappel anchor (*See Chapter 3 Rappel Anchor Inspection*).
 - C. Rappellers begin gearing up for the rappel.
- ##### 2. Loading/Boarding
- A. Spotter oversees securing of cargo (*Refer to Cargo Deployment Procedures page B-37*).
 - B. Rappellers complete buddy check to include buddy's rope and genie.
 - C. Ropes are then attached to the rappel anchor with steel locking carabiners; the safety snub is then attached to each rope. Once completed, all rigging must be inspected by the spotter assigned to that mission.
 - D. The rappellers then go to their designated side of the aircraft and “inspect rigging”, “hook up”, “adjust”, and “lock off” the Sky Genie.

*NOTE- to properly adjust Sky Genie- assume the rappel stance/squat on the skid.

- E. The rappellers standby for the spotter check. Right side rappeller completes equipment check on spotter.
- F. The spotter then initiates the spotter check, one rappeller at a time, by starting with the rappeller on the pilot side of the aircraft and then moving to rappeller on the spotter side. When complete the spotter gives the thumbs up signal. Rappellers then move to their assigned rear seat and fasten their seat belt.
- G. The spotter connects his/her spotter tether to an approved attachment point, displays harness, PPE, tether, and knife to rappellers and exchanges a thumbs up signal if all is OK.
- H. The spotter enters the aircraft, takes seat, fastens seat belt, and plugs into radio system. Spotter displays seat belt- checks rappeller's seat belts, checks all cargo, assures rope bags are secured, and a thumbs-up signal is exchanged one last time.
- I. The spotter gives "O.K." to pilot to take off and reminds pilot if there is an external load attached.

In-Flight Operations

1. The Rappel

- A. Pilot flies a reconnaissance of the area to look for hazards and works with spotter in selecting an appropriate landing or rappel site.
- B. Pilot and spotter select rappel site and then consider alternate emergency site in the event that one or both rappellers need to tie off and be flown to the emergency site.
- C. Contact appropriate flight following authority (ATGS, HLCO, dispatch, etc.) prior to commencing the rappel sequence.
- D. Radio volume is adjusted, if necessary.
- E. Pilot must perform power check prior to rappel operations- (see note P.35)
- F. Pilot announces, "*One minute out*".

- G. Activate hot mike. From this point on all spotter actions are verbalized to pilot.

NOTE: An OGE Power check is accomplished prior to entering rappel hover at an altitude comparable to the site or greater. A positive rate of climb must be established *without exceeding aircraft limitations*. For internal cargo operations, the spotter may bring rappellers out of their seat belts after completion of power check.

- H. Helicopter is positioned over the designated rappel site with spotter assistance. Terminology should use pilot's perspective (*your side, my side, forward, back and up or down relative to altitude above the ground*).
- I. Pilot establishes hover, checks power, gives "O.K" to proceed.

NOTE: If using external cargo delivery, rappellers remain in their seat belts until cargo portion is complete. Refer to Cargo Deployment Procedures page B-36.

- J. Spotter states "*dropping rope(s)*", pilot responds "O.K " or "No". IF pilot responds "No", spotter and pilot will reassess situation and take appropriate action.
- K. If okay, spotter signals rappellers to drop their rope bags *inside of the skids, (downward sweeping motion of arms with index finger extended)*. Spotter checks that the ropes are free of knots and rope bag(s) is on the ground and informs pilot the "*ropes are on the ground*".
- L. Spotter states "*rappellers to skids*" pilot responds "O.K " or "No". IF pilot responds "No", spotter and pilot will reassess situation and take appropriate action.
- M. If okay, spotter signals each rappeller (*locked hands*) to move into position on skid.
- N. Rappeller exits to skid by placing outboard foot on step, backing out, and placing inboard foot to skid first.
- O. Spotter informs pilot of rappeller(s) movements, informing pilot when rappeller(s) are in pre-rappel position on the skid(s). Once the rappeller is in position on skid, both spotter and rappeller must "clear rope" by checking entire rope from anchor to ground, looking for any knots, rope hang-ups, obstructions in the descent path and that rope bags are on the ground. IF pilot responds "*Power O.K*", spotter completes visual equipment check. IF pilot responds "No", spotter signals rappeller(s)

back into cabin (*raised clenched fists, bent elbows moving together. Rappeller(s) returns to their seat and fastens seat belt.*)

- P. Spotter states, "*sending rappellers,*" pilot responds "O.K " or "No". IF pilot responds "No", spotter and pilot will reassess situation and take appropriate action.

NOTE: If at any time the pilot (or spotter) indicates a problem, the spotter and pilot will reassess the situation and take appropriate action. This may include the spotter aborting the mission and signaling rappeller(s) back into the aircraft or merely delaying sending them.

- Q. If okay, spotter signals rappeller(s) to descend (*palms down sweeping motion*).
- R. Rappellers then exit skids. After loading body weight on rope, unlock and descend to the ground at controlled rate. The spotter notifies the pilot of the position of the rappeller(s) from the aircraft to the ground.
- S. After reaching the ground, rappeller(s) disconnect from the rope and move to a safe area.
- T. Spotter advises the pilot "*rappellers clear,*" disconnects safety snub strap and secures it, disconnects and drops the rope(s); and advises the pilot "*ropes on ground.*"
- U. Spotter advises pilot "*clear to fly away*"; pilot may elect to remain in hover to initiate internal cargo procedure and advises spotter accordingly.
- V. Radio returned to normal operational mode and flight following authority is informed that the rappel sequence has been completed. The helicopter should remain in the area until radio contact is established with rappellers.

NOTE: The spotter and pilot may elect to deploy one rappeller at a time for a variety of reasons. This is an acceptable practice. Rappel operations with single rappeller on board will be from the left side only. The National Helicopter Operations Specialist for Forest Service rappel operations must approve any other variations in these procedures. DOI agencies shall receive approvals from their agencies' national aviation operations specialist prior to deviating from these procedures.

Cargo Deployment Procedures

There are two (2) cargo delivery methods for the Bell 206L Series. The two methods are internal and external delivery.

Overhead/Floor Anchor Internal Cargo

1. Pre Deployment

NOTE: Due to lateral C.G. limitations, cargo will be deployed from the left (observers) side of the helicopter.

NOTE: Spotter Safety Checks as per Chapter 7, Section IV shall be followed.

- A. Remove doors at pilots and spotters discretion.
 - B. Spotter puts on harness, knife readily accessible.
 - C. Visually inspect anchor (*See Chapter 3, Rappel Anchor Inspection*).
 - D. Secure cargo in helicopter.
 - E. Secure harness tether to an approved attachment point. Assure carabiners, figure 8 and letdown lines are on board. Enter aircraft and buckle seat belt.
2. Approach to Drop Site:
- A. Recon area for hazards and confirm deployment site with pilot.
 - B. Identify and check alternate site.
 - C. Rig letdown line through figure 8, attach figure 8 to positive locking steel carabiner on overhead or floor anchor, and lock carabiner for deployment. Then attach end of letdown line to positive locking steel carabiner on cargo, and lock carabiner. Take up any additional slack. Inform pilot that cargo is rigged and to proceed into the cargo site. Note- spotter and pilot may elect to stay over the rappel site during cargo rigging operations.
 - D. Inform ground personnel to stay clear of cargo during deployment.
 - E. Inform flight following that radio will be turned down (if not already done).

- F. Activate hot mike. From this point on all spotter actions are verbalized to pilot.

3. Hover Position

- A. Helicopter is positioned over the designated rappel site with spotter assistance. Terminology should use pilot's perspective (*your side, my side, forward, back and up and down relative to altitude above the ground*)
- B. Spotter Checks power with pilot. Suggested verbiage to use when in hover over spot.

SPOTTER: *"How's Power?"*

PILOT: *"Power is good"*

SPOTTER: *"Ready To Deploy"*

PILOT: *"Go Ahead"*

CAUTION: Spotter shall not move cargo outside the aircraft until the pilot announces power is good.

4. Cargo Deployment

- A. Ease cargo out of door, lowering between fuselage and skid.
- B. Lower cargo with positive control of letdown line. Via hot mike, keep pilot informed of actions and progress of cargo descent:
 - *"Cargo out the door";*
 - *"Cargo halfway down";*
 - *"Cargo on ground, etc."*
- C. When cargo is on ground, hold slack in line to prevent billowing (if deploying split load, attach cargo to letdown line and repeat steps a and b), unhook figure 8, remove figure 8 from letdown line, and secure figure 8 in aircraft.
- D. Wrap excess letdown line around the accordion pack and drop pack to the ground.
- E. Inform pilot if more cargo is to be lowered with additional letdown line. Pilot will determine whether to hover or orbit area until cargo is ready for subsequent deployment. When cargo deployment is complete and rigging is clear of aircraft, inform pilot *"We're clear to fly away"*.

Overhead Anchor External Cargo

NOTE: Due to lateral C.G. limitations, cargo will be deployed from the left (observers) side of the helicopter only.

1. Pre-Deployment Procedures:

NOTE: Spotter Safety Checks as per Chapter 7, Section IV shall be followed.

- A. Spotter puts on harness.
- B. Attach cargo to swivel.
- C. Perform all appropriate hook checks.
- D. Attach swivel connected to cargo strap to helicopter belly hook.

NOTE: A swivel will be required with all external loads. The swivel attachment ring inside diameter must meet helicopter hook specifications.

- E. Attach single hard loop end of breakaway strap to the top end of the swivel hardware.
- F. Rig letdown line through figure 8 and attach to positive locking steel carabiner on overhead or floor anchor and lock carabiner. On overhead anchor, pull carabiner and line down; level with the horizontal rear seat cushion.
- G. Lock off letdown line on figure 8.
- H. Attach positive locking steel carabiner on rigged letdown line to the velcro loop on the breakaway strap.
- I. Secure accordion pack and harness tether to approved attachment point.
- J. Spotter performs final cargo letdown system inspection and fastens seat belt.
- K. Spotter tells pilot “*OK to depart*” and informs pilot that there is an external load attached to the cargo hook.

NOTE: Maintain positive control of letdown line enroute to the deployment site.

2. Approach to Drop Site.

- A. Recon area for hazards and confirm deployment site with pilot.
- B. Identify and check alternative site.
- C. Inform ground personnel to stay clear of cargo during deployment.
- D. Inform flight following that the radio will be off frequency (if not already done).
- E. Activate hot mike. From this point on all spotter actions are verbalized to pilot.

3. Hover Position

- A. Helicopter is positioned over the designated rappel site with spotter assistance. Terminology should use pilot's perspective (*your side, my side, forward, back and up and down relative to altitude above the ground*)
- B. Spotter Checks power with pilot. Suggested verbiage to use when in hover over spot.

SPOTTER: *"How's Power?"*

PILOT: *"Power is good"*

- C. If power is good, spotter initiates cargo hook-up.

4. Cargo Hook Up and Deployment.

- A. Attach letdown line to hard loop on breakaway strap with positive locking steel carabiner. Lock carabiner.
- B. Unlock figure 8 and remove slack in line to allow for a smooth deployment.
- C. Spotter manually places carabiner over doorsill of helicopter, then informs pilot that cargo is rigged and ready for deployment on pilots count.
- D. Pilot gives a three (3) count and releases cargo from belly hook.

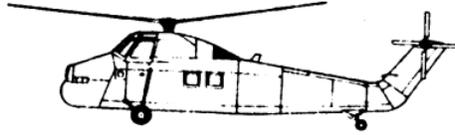
NOTE: Maintain a tight letdown line at all times. Do not allow unarrested descent.

- E. Spotter communicates with pilot as load descends to the ground.

- F. When the cargo reaches the ground, the left side rappeller will hold the letdown line taught. This will make the removal of the figure 8 easier for the spotter (overhead anchor only).
- G. Secure the figure 8 inside the aircraft.
- H. Wrap excess letdown line around the accordion pack and drop pack to the ground.
- I. After the accordion pack and line are clear of the helicopter, the spotter communicates to the pilot that the cargo is clear.
- J. Pilot may remain in hover or depart and return to deploy rappellers.
- K. Spotter will proceed with deploying rappellers.
- L. After completion of mission reestablish communications with flight following.

NOTE: When cargo procedures are complete, spotter may then deploy rappellers. Refer to In Flight Operations page B-34.

B-6



SIKORSKY 58T RAPPEL PROCEDURES WITH OAS RAPPEL ANCHOR

On Ground: Pre-Rappel

1. Configure helicopter.

NOTE: The helicopter will be configured to meet the needs of the specific rappel mission. It is also permissible for the rappellers to wear belly bags at the discretion of the program manager.

- A. Lock door in open position, secure all loose items in cabin. (*Refer to Cargo Deployment Procedures page B-47*).
- B. Spotter visually inspects rappel anchor, safety snub strap and rappeller gunner straps (See Chapter 3, Rappel Anchor Inspection). This will include ensuring that rappeller gunner straps are adjusted for proper length to allow access to the doorway and genie(s), but insufficient length to allow egress from the aircraft.
- C. Spotter oversees securing of cargo, with adequate letdown gear. (Refer to Cargo Deployment Procedures page B-47).
- D. Attach carabiner to two (2) adjacent rings on the rappel anchor. Attach rope to carabiner (make sure protective hose is at the bottom end of the rope). Connect the safety snub strap between the first and second swedges of the rope, attaching the free end of the safety snub strap to additional ring on the rappel anchor. Spotter confirms the appropriate number of genies are rigged for mission requirements.

NOTE: The rope may be configured with any number of genies (not to exceed 5 genies) depending on mission requirements.

- E. Rappellers complete buddy check.

2. Loading/Boarding

- A. Rappellers organize into proper rappel order and prepare to board the aircraft.

NOTE: First rappeller to be deployed, needs to be seated aft. Proper deployment sequence for the S-58T is from aft to forward.

- B. The first rappeller to be checked, check's the spotter's PPE and harness.
- C. When rappeller's check of spotter's PPE and harness are complete, rappeller and spotter exchange "*thumbs up*".
- D. Spotter initiates spotter's checks of rappellers, one rappeller at a time.
- E. When all checks are completed, both the spotter and rappeller exchange a "*thumbs up*". Rappeller boards the aircraft, takes assigned seat, attaches gunner strap around torso above Forgecraft hook, and fastens seat belt around waist below Forgecraft hook.
- F. Repeat the process with each rappeller.
- G. Prior to boarding aircraft, the last rappeller to be checked, visually inspects rigged genie(s), rope attachment, and safety snub strap. Spotter observes rappellers check of rappel hardware. When all checks are completed, rappeller and spotter exchange "*thumbs up*".

NOTE: Rappel hardware to be inspected includes steel locking carabiner attached and locked to (2) two adjacent rings on rappel anchor, rope end attached to steel locking carabiner, safety snub strap attached to anchor and rappel rope, and genie(s) attached to rope.

- H. Spotter repeats checks of all rappel hardware. The last rappeller observes spotter check of rappel hardware. When all checks are completed, spotter and rappeller exchange "*thumbs up*".
- I. The last rappeller boards aircraft, takes assigned seat, attaches gunner strap, and fastens seat belt.
- J. Spotter checks that rappeller's seat belts and gunner straps are fastened correctly. When checks are complete, spotter and rappellers exchange "*thumbs up*".
- K. Spotter attaches spotter tether to approved attachment point, spotter displays tether attachment, tether, knife, commo, seat belt, and then exchanges "*thumbs up*" confirmation with rappellers.

In-Flight Operations

1. The Rappel

- A. Pilot flies a reconnaissance of the area to look for hazards and works with spotter in selecting an appropriate landing or rappel site.
- B. Pilot and spotter select rappel site and then consider alternate emergency site in the event that the rappeller needs to tie off and be flown to the emergency site.
- C. Contact appropriate flight following authority (ATGS, HLCO, dispatch, etc.) prior to commencing the rappel sequence.

NOTE: Advise flight following authority that during rappel sequence, radio volume will be adjusted down to provide for a sterile cockpit, however, the ability to transmit emergency messages will still be maintained.

- D. Radio volume is adjusted.
- E. Pilot announces, "*One minute out*".

NOTE: An OGE power check is accomplished prior to entering rappel hover at an altitude comparable to the site or greater. A positive rate of climb must be established *without exceeding aircraft limitations*.

- F. Activates hot mike. From this point on all spotter actions are verbalized to the pilot.
- G. Spotter removes seat belt and moves into position.
- H. Spotter designates specific rappellers if less than a full load is to be deployed.
- I. Pilot positions helicopter over the designated rappel site, with spotter assistance. Terminology should use pilot's perspective (*right side, left side, forward, back, up or down relative to altitude above the ground*). Allow sufficient hover height above canopy to facilitate multiple rappellers.
- J. Pilot establishes hover, checks power, gives the "O.K." or *No*". If pilot responds "*No*", spotter and pilot will reassess situation and take appropriate action.

NOTE: Internal cargo may be delivered at this time; rappellers shall remain in seat belts until cargo portion complete. Refer to Cargo Deployment Procedures page B-47.

NOTE: Rappeller(s) may assist spotter with specific tasks when requested. Refer to Cargo Deployment Procedures page B-47

- K. Spotter states “*dropping rope*”, pilot responds “*O.K.*” or “*No*”. IF pilot responds “*No*”, spotter and pilot will reassess situation and take appropriate action.
- L. Spotter drops rope bag and ensures it is free of knots and rope bag is on the ground.
- M. Spotter states “*starting rappeller*”, pilot responds “*O.K.*” or “*No*”. IF pilot responds “*No*”, spotter and pilot will reassess situation and take appropriate action.
- N. Spotter signals individual rappeller with the remove seat belt signal. Rappeller removes seat belt and moves into pre-rappel position. Rappeller grasps and attaches genie to Forgecraft hook and locks off (spotter may assist). The spotter does a visual inspection of each rappeller hook-up and lock-off, ensuring rappeller’s right hand is on gunner strap release. Spotter signals approval of hook-up and lock-off by giving rappeller the locked hands signal; upon receipt of the locked hands signal each rappeller detaches the gunner strap and moves into position on the step.

NOTE: Rappeller extends genie with left hand, displaying that the genie and Forgecraft hook are properly attached.

- O The spotter does a visual inspection of the rappeller hook-up and lock-off, ensuring rappeller’s right hand is on the gunner’s strap release and confirms with the locked hand signal. Upon receipt of locked hand signal, the rappeller detaches the gunner strap and moves to the bottom step. Once the rappeller is in position on the step, both spotter and rappeller must “clear rope” by checking entire rope from anchor to ground, looking for any knots, rope hang-ups, obstructions in the descent path and that the rope bag is on the ground.

NOTE: Spotter will ensure that rappeller properly detaches gunner strap.

- P. Spotter informs pilot of rappeller movement, informing pilot when rappeller is in pre-rappel position on the step. If pilot responds, “*power O.K.*”, spotter completes visual equipment check. If pilot responds, “*No*”, spotter signals rappeller back into cabin (*raised clenched fist, elbows*

moving together). Rappeller returns to closest available seat and fastens seat belt.

- Q. Spotter states “*sending rappeller*”, pilot responds “*O.K.*; or *No*”. If pilot responds “*No*,” spotter and pilot will reassess situation and take appropriate action.

NOTE: If at any time the pilot (or spotter) indicates a problem, the spotter and pilot will reassess the situation and take appropriate action. This may include the spotter aborting the mission and signaling rappeller back into the aircraft or merely delaying sending them.

- R. If O.K., spotter signals rappellers to descend. (*palm(s) down in a sweeping motion*)
- S. Rappeller will then unlock, exit lower step, and descend at a controlled descent rate. The spotter notifies the pilot of the position of the rappeller from the aircraft to the ground.
- T. After reaching the ground, rappeller disconnects from rope and moves to a safe area.
- U. Spotter confirms gearies on ground and directs the pilot to lower aircraft as necessary.
- V. Spotter advises pilot “*rappeller(s) clear*”, and repeats process as necessary. When all rappellers are clear, drops rope and advises pilot “*rope on the ground*”.

NOTE: If more than the maximum number of rappellers per rope are to be deployed, the closest rappeller to the door shall maintain control of the rope bag and rope as the spotter connects the rope to the anchor.

NOTE: Rappeller observes spotter inspection of proper attachment of rappel hardware. Rappeller and spotter exchange “thumbs up” confirmation of hardware inspection.

- W. Spotter advises pilot “*clear to depart*”. Pilot departs rappel site, spotter returns to seat and fastens seat belt.
- X. Radio is returned to normal operational mode and flight following authority is informed that the rappel sequence has been completed. The helicopter should remain in the area until radio contact has been established with the rappellers.

NOTE: The National Helicopter Operations Specialist for Forest Service rappel operations must approve any variations in these procedures. DOI agencies shall receive approvals from their agencies' national aviation operations specialist prior to deviating from these procedures.

Cargo Deployment Procedures

For the Sikorsky S-58T internal cargo is all that is developed at this time.

1. Pre Deployment

NOTE: Spotter Safety Checks as per Chapter 7, Section IV shall be followed.

- A. Spotter puts on harness, knife readily accessible.
- B. Rig load(s) with carabiner; secure inside aircraft;
- C. Attach carabiner to rappel anchor, with gate facing inboard. Carabiner oriented pear side downward, gate facing inboard.
- D. Attach figure 8 to carabiner on rappel anchor.

NOTE: Figure 8 should be rigged to prevent crossing of letdown line and unintentional line abrasion.

- E. Secure accordion pack and harness tether to an approved attach point.
- F. Do verbal check with pilot: (See note at top of B-48)
 - *“Carabiners locked”;*
 - *“Spotter safety tether and seat belt are secure”;*
 - *“Knife is accessible”;*
 - *“Accordion pack is secure”;*
 - *“Cargo is secure”;*

2. Approach to Drop Site:

- A. Recon area for hazards and confirm deployment site with pilot.
- B. Identify and check alternate site.
- C. On pilot's concurrence unbuckle seat belt and move to door.
- D. Inform ground personnel to stay clear while deploying cargo.
- E. Contact appropriate flight following authority (ATGS, HLCO, dispatch, etc.) prior to commencing the cargo letdown sequence.

NOTE: Advise flight following authority that during rappel sequence, radio volume will be adjusted down to provide for a sterile cockpit, however, the ability to transmit emergency messages will still be maintained.

- F. Radio volume is adjusted, if necessary
- G. Activate hot mike. From this point on all spotter actions are verbalized to pilot.
- H. Attach figure 8 to carabiner at anchor.

3. Hover Position

- A. Communicate with pilot to position helicopter over deployment spot. Terminology should use pilot's perspective (*your side, my side, forward, back and up or down relative to altitude above the ground*)
- B. Spotter checks power with pilot. Suggested verbiage to use when in hover over spot.

SPOTTER: *"How's Power?"*

PILOT: *"Power is good"*

SPOTTER: *"Ready To Deploy"*

PILOT: *"Go Ahead"*

CAUTION: Spotter shall not move cargo outside the aircraft until the pilot announces power is OK.

4. Cargo Deployment

- A. Ease cargo out of door, and hold out away from step. Via hot mike, keep pilot informed of actions:
 - *"Cargo out the door";*
 - *"Cargo halfway down";*
 - *"Cargo on ground, etc. "*
- B. Personnel on the ground shall stay clear and maintain visual contact with the aircraft and cargo being lowered.
- C. When cargo is on ground, hold slack in line to prevent billowing (if deploying split load, attach cargo to letdown line and repeat steps A and B), unhook figure 8, remove figure 8 from letdown line, and secure figure 8 in aircraft.

- D. Wrap excess letdown line around the accordion pack and drop pack to the ground.
- E. Inform pilot if more cargo is to be lowered with additional letdown line. Pilot will determine whether to hover or orbit area until cargo is ready for subsequent deployment. When cargo deployment is complete and rigging is clear of aircraft, inform pilot "*We're clear to fly away*".

NOTE: Figure 8 may be rigged and hung on bracket in flight.

NOTE: IF RAPPELLERS ARE DELIVERED BEFORE CARGO THEN THE SEQUENCE OF EVENTS WILL BE ADJUSTED ACCORDINGLY TO REFLECT THIS (*i.e. items accomplished in the deployment of rappellers do not need to be repeated*).

B-7



***BELL-407 RAPPEL PROCEDURES WITH
AERONAUTICAL ACCESSORIES OVERHEAD RAPPEL ANCHOR***

On-Ground: Pre-Rappel

1. Configure helicopter.

NOTE: The helicopter will be configured to meet the needs of the specific rappel mission. It is also permissible for rappellers to wear belly bags at the discretion of the program manager.

- A. Rear doors removed, front doors and litter door removed at pilots and spotters discretion, loose items removed from rear seat area, center rear seat belt secured.
- B. Visually inspect rappel anchor. *(See Chapter 3, Rappel Anchor Inspection)*
- C. Attach cargo letdown line protective cradle to base plate and ensure keeper pin is in place.

2. Loading/Boarding

- A. Spotter oversees securing of cargo *(this would include attachment of cargo to belly hook for external method. Refer to Cargo Deployment Procedures page B-56)*.
- B. Rappellers complete buddy check to include buddy's rope and genie.
- C. Safety snub strap is attached to the forward carabiner at each anchor, and secured to the ceiling by velcro.
- D. Rappeller(s) approach aircraft and place rope bags on floor of helicopter. Right side rappeller completes equipment check on spotter. Rappeller(s) will connect end of rope to lower locking steel carabiner in the "Y" configuration *(make sure the protective hose is at the bottom end of the rope)*.

- E. Rappeller(s) will connect descent device to harness, adjust length of rope to descent device to ensure proper position on the skid, then lock-off.
- F. Spotter initiates equipment check, one rappeller at a time outside the aircraft, beginning with right side rappeller.
 - 1) Both carabiners locked on anchor, with barrels down in the locked position, facing outboard.
 - 2) Ensure steel locking carabiner attaching rope to anchor is forward facing and goes through both carabiners, locked with barrel down.
 - 3) Safety snub strap is in place on forward carabiner.
 - 4) Descent device rigged properly and locked-off.
 - 5) Check connection of descent device to harness. Check Forgecraft hook and make sure tri-link is through both harness loops and barrel is tight.
 - 6) Check fit of harness, positive connection of belly bag to harness (if applicable), and proper placement of knife.
 - 7) PPE check (helmet, eye protection, clothing, gloves, etc.).
 - 8) If all items are correct and ready, thumbs up will be exchanged between spotter and rappeller. IF NOT, reinitiate equipment check.
 - 9) Rappeller then enters helicopter and fastens seat belt ensuring that both shoulder and lap belt are under hook and tri-link.
 - 10) Repeat process with left side rappeller.
- G. After both rappeller checks have been completed and rappeller(s) have boarded aircraft, the spotter configures cargo deployment equipment and boards helicopter. (*see Cargo Deployment Procedures page B-56*)
- H. Spotter attaches spotter harness tether to approved attachment point, fastens seat belt, plugs into avionics and then inspects rappeller(s) seat belt, displays tether, knife, and seat belt to rappeller(s) and exchanges (*thumbs up*) signal. Gives "O.K." to pilot to take off and reminds pilot if there is an external cargo load attached.

In-Flight Operations:

1. The Rappel

NOTE: In the Bell 407, Lateral CG requirements need to be considered at all times. Spotter movements in conjunction with rappeller seating must comply with operational CG limitations of aircraft.

- A. Pilot flies a reconnaissance of the area to look for hazards and works with spotter in selecting an appropriate landing or rappel site.
- B. Pilot and spotter select rappel site and then consider alternate emergency site in the event that one or both rappellers need to tie off and be flown to the emergency site.
- C. Contact appropriate flight following authority (ATGS, HLCO, dispatch, etc.) prior to commencing the rappel sequence.
- D. Radio volume adjusted, if necessary.
- E. Pilot announces "*One minute out*".
- F. Activate hot mike. From this point on all spotter actions are verbalized to pilot.

NOTE: An OGE Powercheck is accomplished prior to entering rappel hover at an altitude comparable to the site. A positive rate of climb must be established without exceeding aircraft limitations.

- G. Helicopter is positioned over the designated rappel site with spotter assistance. Terminology should use pilot's perspective (*your side, my side, forward, back and up or down relative to altitude above the ground*).
- H. Pilot establishes hover, checks power, gives "*O.K.*" to proceed.

NOTE: If using external cargo delivery, rappellers remain belted until cargo portion is complete. Refer to Cargo Deployment Procedures page B-56.

- I. Spotter removes and secures seat belt. This is the signal for rappeller(s) to remove and secure seat belts. Spotter informs pilot.
- J. Spotter states "*dropping rope(s)*", pilot responds "*O.K.*" or "*No*". IF pilot responds "*No*", spotter and pilot will reassess situation and take appropriate action.

- K. If okay, spotter signals rappeller(s) to drop rope bag(s) outside of the skids, (*downward sweeping motion of arms with index finger extended*). Spotter checks that the rope(s) are free of knots and rope bag(s) are on the ground and informs pilot the "*ropes are on the ground*".
- L. Spotter states "*rappellers to skids*" pilot responds "*O.K*" or "*No*". IF pilot responds "*No*", spotter and pilot will reassess situation and take appropriate action.
- M. If okay, spotter signals each rappeller (*locked hands*) to move into position on skid.
- N. Rappeller(s) exit to skid by placing outboard foot on step, backing out, and placing inboard foot directly to skid. Rappeller(s) may utilize overhead carabiner with inboard hand to facilitate exit. *Rappeller must assure rope is on right side of body* when in position on skid. This can be accomplished during transition from step to skid.
- O. Spotter informs pilot of rappeller movements, informing pilot when rappeller(s) are in pre-rappel position on skid(s). Spotter and rappeller(s) perform final visual inspection of rope(s). Once the rappeller is in position on skid, both spotter and rappeller must "clear rope" by checking entire rope from anchor to ground, looking for any knots, rope hang-ups, obstructions in the descent path and that rope bags are on the ground. IF pilot responds "*Power O.K.*", spotter completes visual equipment check. IF pilot responds "*No*", spotter signals rappeller(s) back into cabin (*raised clenched fists, bent elbows moving together*). *Rappeller(s) returns to their seat and fastens seat belt*).
- P. Spotter states, "*sending rappellers*," pilot responds "*O.K*" or "*No*". IF pilot responds "*No*", spotter and pilot will reassess situation and take appropriate action.

NOTE: If at any time the pilot (or spotter) indicates a problem, the spotter and pilot will reassess the situation and take appropriate action. This may include the spotter aborting the mission and signaling rappeller(s) back into the aircraft or merely delaying sending them.

- Q. If okay, spotter signals rappeller(s) to descend (*palms down sweeping motion*).
- R. Rappeller(s) then unlock genie(s), and begin exit from skid. The spotter notifies the pilot of the position of the rappeller(s) from the aircraft to the ground.

- S. After reaching the ground, rappeller(s) disconnect from the rope and move to a safe area.
- T. Spotter advises the pilot "*rappellers clear,*" then disconnects and drops each rope. Spotter returns to seat, refastens seat belt and advises the pilot, "*Ready to depart*".
- U. Radio returned to normal operational mode and flight following authority is informed that the rappel sequence has been completed. The helicopter should remain in the area until radio contact is established with rappeller(s).

NOTE: The spotter and pilot may elect to deploy one rappeller at a time for a variety of reasons. This is an acceptable practice. Rappel operations with single rappeller on board will be from the left side only. Any other variations in these procedures must be approved by the National Helicopter Operations Specialist for Forest Service rappel operations. DOI agencies shall receive approvals from their agencies' national aviation operations specialist prior to deviating from these procedures.

Operational limitations when rappelling outside the skids in the Bell 407 equipped with the Aeronautical Accessories overhead rappel anchor (External Cargo).

- The maximum equipped rappeller weight (including rope) for simultaneous two (2) person rappel operations when left front crew seat is vacant is 265 lbs.
- The maximum equipped rappeller weight (including rope) for simultaneous two (2) person rappel operations when left front crew seat is occupied is 235 lbs.
- For external cargo operations with simultaneous two person rappelling, the lighter rappeller shall occupy the right side.
- The combined weight of crew (front) seat occupants shall not exceed 460 lbs. for external cargo operations during simultaneous two (2) person rappel operations.
- Cargo shall be lowered prior to rappelling activities (*external cargo method*).
- Spotter shall remain on left side during right side rappeller stuck-on-rope recovery operations (*the recovery starts as soon as the left side rappeller is off the rope*).
- **Single person rappelling from the right side is prohibited.**
- Single person rappelling from the left side is permitted only after a mission specific weight and balance calculation has been performed utilizing the worst case scenario(s) (*e.g., 30 minutes fuel; bad rappel procedures {2.3 gls}; rappeller stuck-on-rope*).

Cargo Deployment Procedures

At this time the only developed system for cargo letdown is external.

1. Pre Deployment

NOTE: Due to lateral C.G. limitations, cargo will be deployed from the overhead anchor mounted on the left (observers) side of the helicopter only.

NOTE: Spotter Safety Checks as per Chapter 7, Section IV shall be followed.

- A. Spotter puts on harness, knife readily accessible.
- B. Rear doors removed, front doors and litter doors removed at the pilots and spotters discretion
- C. Cargo container is set up and loaded at front of helicopter on pilot's side.
- D. Spotter performs all appropriate hook checks, attaches single hard loop end of breakaway strap to the top end of the swivel hardware, and then connects swivel system and cargo to helicopter cargo hook.

NOTE: A swivel will be required with all external loads. The swivel attachment ring inside diameter must meet helicopter hook specifications.

- E. Rig letdown line through figure eight. The figure eight is then attached with a locking "D" carabiner to both anchor carabiners with barrel facing aft and up, outboard of rappel rope carabiner (*if rigged for rappel*).
- F. The letdown line, with locking "D" carabiner attached, is pulled down through figure eight so that carabiner is level with the rear seat cushion.
- G. Attach locking "D" carabiner on rigged letdown line to the velcro loop on the breakaway strap.
- H. Lock off let down line on figure eight.
- I. Secure accordion pack and harness tether to approved attachment point.
- J. Spotter performs final cargo letdown system inspection and fastens seat belt.

- K. Spotter tells pilot “*OK to depart*” and informs pilot that there is an external load attached to the cargo hook.

NOTE: Maintain positive control of letdown line enroute to the deployment site.

2. Approach to Drop Site.

- A. Recon area for hazards and confirm deployment site with pilot.
- B. Identify and check alternative site.
- C. Inform ground personnel to stay clear during cargo deployment.
- D. Adjust radio volume, if necessary.
- E. Activate hot mike. From this point on all spotter actions are verbalized to pilot.

NOTE: An OGE Powercheck is accomplished prior to entering rappel hover at an altitude comparable to the site. A positive rate of climb must be established *without exceeding aircraft limitations.*

3. Hover Position.

- A. Spotter may elect to remove and secure seat belt or remain belted during cargo deployment.
- B. Helicopter is positioned over the designated rappel site with spotter assistance. Terminology should use pilot's perspective (*your side, my side, forward, back and up or down relative to altitude above the ground*).
- C. Spotter Checks power with pilot. Suggested verbiage to use when in hover over spot:

SPOTTER: “*How's Power?*”

PILOT: “*Power is good*”

- D. If power is good, spotter initiates cargo hook-up.

4. Cargo Hook Up and Deployment.

- A. Attach carabiner to hard loop on breakaway strap and lock carabiner.
- B. Unlock figure eight and remove slack in line to allow for a smooth deployment.

- C. Place letdown line in cradle and ensure carabiner is clear of fuselage. If rappeller(s) are on board, left side rappeller should hold letdown line secure in cradle during deployment.
- D. Spotter informs pilot that cargo is rigged and ready for deployment on pilots count.
- E. Pilot gives a three (3) count and releases cargo from belly hook.

NOTE: Maintain a tight letdown line at all times. Do not allow unarrested descent.

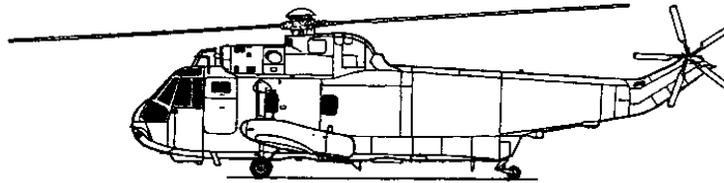
- F. Via hot mike, keep pilot informed of actions and progress of cargo descent:
 - *"Cargo halfway down";*
 - *"Cargo on ground, etc. "*
- G. When cargo reaches the ground, spotter disconnects and secures figure eight, wraps excess line around pack and drops it between flight step and fuselage.

NOTE: Rappellers may assist spotter in cargo letdown procedures as follows: When cargo reaches the ground, the left side rappeller will hold the letdown line taut. This will prevent excess feeding of the letdown line and facilitate an easy removal of the figure eight for the spotter. The right side rappeller disconnects accordion pack while spotter disconnects figure eight. Spotter hands right side rappeller figure eight while taking accordion pack. Right side rappeller secures figure eight.

- H. After the accordion pack and line are clear of the helicopter, the spotter communicates to the pilot that the cargo is clear.
- I. Pilot may depart or remain in hover to deploy rappellers.
- J. After completion of mission reestablish communications with flight following.

NOTE: When cargo procedures are complete, spotter may then deploy rappellers. Refer to In Flight Operations page B-51.

B-8



SIKORSKY S-61 RAPPEL PROCEDURES

On Ground: Pre-Rappel

1. Configure Helicopter.

NOTE: The helicopter will be configured to meet the needs of the specific rappel mission. It is also permissible for rappellers to wear belly bags at the discretion of the program manager.

- A. Cargo letdown bags/boxes will be inspected for secure packaging and loaded into aircraft and secured at left cabin wall hard point with a carabiner.
- B. Spotter visually inspects rappel anchor (*see chapter 3, Rappel Anchor inspection*) and begins rigging process, attaching one carabiner to OUTSIDE bracket ring with the gate facing inward, this secures rope during rappel sequence. If the mission is cargo delivery, the anchor is rigged by attaching one carabiner to the INSIDE bracket ring with the gate facing inward, this secures the figure 8. (*The rope or figure 8 is not attached at this time, it is attached to the appropriate carabiner and the safety snub strap is attached to the inside bracket ring as per procedure outlined at **IN FLIGHT OPERATIONS**, see section I*). Spotter attaches rappeller gunner strap to ceiling mount above seat #3, ensuring proper length to allow access to doorway and genies, but insufficient length to allow egress from the aircraft.
- C. Spotter attaches required number of Sky Genies (*maximum of 5*) and safety snub strap to rope between the first and second swedges. Spotter sets rope bag on seat #2 and buckles seat belt into bag loops. If second rope is required, the bag will be secured to left wall hard point with carabiner through bag loops in front of seat #3. (*Bags and snub strap may be pre-rigged*).

- D. Spotter will inspect and attach cargo letdown tape bag to left cabin wall hard point with a carabiner. Figure 8 will be taped on top of bag/box to secure it during flight. (*Refer to cargo deployment procedures for S-61 at end of this chapter*).

2. Loading/Boarding

- A. Rappellers organize into pairs and complete buddy check process.

NOTE: Gear will be buddy checked for loose items, and proper attachment to harness for belly bags. All equipment worn will not interfere with the proper function of the rappel harness, or the ability to assume the emergency crash position in the aircraft.

- B. Rappellers organize into deployment sequence determined by Spotter. Spotter then performs final equipment/Spotter check on each rappeller. Rappeller #1 inspects Spotter's harness and PPE.
- C. Rappellers are cleared to board aircraft to pre-assigned seats.
- D. Each rappeller moves to assigned seat and secures seat belt.
- E. Rappeller in seat #3 attaches to gunner strap
- F. Specific seating assignments are as follows:
 - #1 – Reserved for Spotter.
 - #3 - On deck rappeller (*crew supervisor/IC*), inspects rigging of second rope if required, gives thumbs up to Spotter if OK.
 - #5 - Inspects rigging of rope, gives thumbs up to spotter is OK.
- G. All other rappellers load forward to aft.
- H. Spotter boards aircraft, secures seat belt, attaches avionics, and prepares for flight.

In Flight Operations

1. The Rappel

- A. Pilots (PIC and co-pilot) fly a reconnaissance of the area to look for hazards and work with the spotter in selecting an appropriate landing or rappel site.
- B. Pilot and Spotter select rappel site and alternate flyaway emergency site in the event a rappeller is unable to complete the descent and must be relocated.

- C. Contact will be made to appropriate flight following authority (ATGS, HLCO, Dispatch, etc.) prior to commencing the rappel sequence.

NOTE: An OGE Powercheck is accomplished prior to entering rappel hover at an altitude comparable to the site. A positive rate of climb must be established without exceeding aircraft limitations.

- D. PIC indicates, “*one minute from the site, air speed below 40 knots, rappel sequence may begin*”.
- E. Spotter removes seat belt, disconnects avionics, moves from seat, and attaches Spotter tether carabiner to Spotter bracket. Spotter displays hook-up and emergency knife to rappeller in seat #3, receives thumbs up signal that hook up is correct. At the same time rappeller in seat #3 displays gunner strap is correctly attached and receives thumbs up from Spotter. Spotter hooks into avionics and activates hot mike. From this point on all spotter actions will be verbalized to pilots.
- F. Spotter moves to door and announces to pilot “door coming open”, and then finalizes with pilot proper position over rappel site. Terminology will be “left, right, forward, back, up, down, and number of feet for each direction.”
- G. PIC establishes hover over site at appropriate height.
Spotter to both pilots “ We are over the spot, how is the power?” SIC responds “power is set and good”. PIC responds “I have the spot, you may proceed”.
- H. If either pilot gives a negative response to the Spotter at any time during this segment of the rappel sequence, both will reassess the situation and take appropriate action. It may simply be a slight delay due to repositioning the aircraft or actually aborting the mission depending on the seriousness of the situation..
- I. Spotter retrieves rope end with secured safety snub strap from bag at seat #2, and attaches safety snub strap to INSIDE bracket ring and locks it. Rope end is then attached to OUTSIDE carabiner, Spotter then locks the barrel. Rappeller in seat #5 controls rope bag while Spotter connects rope to anchor. When rope is connected, seat #5 facilitates removal of bag loops from seat belt so Spotter can throw rope bag from aircraft.

NOTE: If internal cargo is to be delivered at this time, all rappellers shall remain in seat belts until cargo delivery is completed. For cargo, the Spotter un-tapes the rigged figure 8 from bag/box and pulls it toward door and attaches it to INSIDE carabiner then locks the barrel..

- J. Spotter will state intentions to drop rope; PIC will respond “OK” or “NO”. If Pilot responds “NO”, Spotter and Pilot will reassess situation and take appropriate action.
- K. Spotter signals first rappeller in seat #3 to unhook seat belt and move into pre-rappel position (*hands clasped at seat belt level and motion of pulling apart seat belt*).
- L. Once rappeller is at door, Spotter points to bracket showing that rope end is attached to carabiner and safety snub strap is hooked and locked between rope swedge and inner ring. Rappeller gives thumbs up to Spotter if hook-up is OK.
- M. Spotter slides Sky Genie down rope to correct position and hands it to rappeller who attaches is to Forgecraft hook and performs lock-off procedure.
- N. Spotter does a visual inspection of the rappeller’s hook-up and lock-off procedures, and confirms with hand signal (*hands clasped at chest level and motion of disconnecting gunner strap*). Upon receipt of hand signal the rappeller will detach the gunner strap and move into position on the step. Rappeller quickly looks down the length of the rope to the ground being aware of any knots in rope and where the landing site is, then turns to face the Spotter with full attention.
- O. Spotter verbalizes sequence: “*Rappeller hooked-up and locked-off, rappeller on the step, sending rappeller, rappeller away*”
- P. If either pilot gives a negative response to the spotter during this portion of the rappel sequence, both will reassess the situation and take appropriate action which may include either a delay in the procedure, or the Spotter may be required to signal the rappeller back into the cabin (*raised arms, clenched fist, bent elbows moving together*). It is important that the pilot and Spotter understand EXACTLY what action is required and no mis-communication occurs.

EMERGENCY PROCEDURE: In the event of an emergency requiring rappeller to re-enter the helicopter, the following procedure will be followed: rappeller re-enters cabin and moves to seat #1 and fastens seat belt. Spotter disconnects or cuts the rope as necessary, closes door, disconnects Spotter tether and avionics, moves to seat #2, secures seat belt, and connects avionics.

- Q. When Rappeller is in position on the step, spotter will give signal to descend (*arm extended, palm down, the spotter making a sweeping downward motion*).
- R. The spotter will observe and verbalize to pilot the entire rappel sequence “*rappeller away, half down, three quarters down, rappeller is on the ground, rappeller is clear*”.

- S. Unless the first rappeller gives a negative signal to the spotter, the next rappeller will complete steps M – S above until the first rope is completed.

NOTE: As each rappeller moves from seat #3 into the pre-rappel position, the next up rappeller (order is left side to right and repeat) removes seat belt and IMMEDIATELY re-positions to seat #3 and attaches seat belt. When the rappeller in the door removes their gunner strap, seat #3 rappeller will retrieve and attach it.

- T. If second load of rappellers is required, Spotter will disconnect rope #1 from safety snub strap and carabiner on anchor and drop clear of aircraft, (leave safety snub strap attached to anchor ring). Spotter attaches rope #2 (positioned at left wall hard point and controlled by rappeller in seat #3), to anchor (carabiner first, safety snub strap second) and repeats procedures K – S. Rappeller in seat #3 facilitates removal of rope bag from carabiner so Spotter can throw rope bag from aircraft.
- U. When all rappellers are on the ground, Spotter will verbalize the disconnect procedure to pilot: “unhooking rope and safety snub strap from bracket, dropping rope, rope is clear, closing door, unhooking Spotter tether, returning to seat, seat belt secure, clear to depart”.

NOTE: The National Helicopter Operations Specialist for Forest Service rappel operations must approve any variations in these procedures. DOI agencies shall receive approvals from their agencies’ national aviation operations specialist prior to deviating from these procedures.

Cargo Deployment Procedures Sikorsky S-61

NOTE: Spotter Safety Checks as per Chapter 7, Section IV shall be followed.

1. CONFIGURE HELICOPTER

- A. Spotter will configure Helicopter to meet the needs of the specific mission (Number of bags/boxes, IA, support, medivac, etc).
- B. Spotter puts on harness, ensures safety knife is readily accessible in Helicopter or attached to harness.
- C. Spotter visually inspects anchor and begins rigging process. (*See Chapter 3, Rappel Anchor Inspection*).
- D. Spotter attaches one carabiner to the INSIDE bracket ring with the gate facing inward, (figure 8 is NOT attached at this time).

- E. Cargo is loaded and secured in helicopter at left cabin wall hard point(s) with one carabiner per bag/box. Cargo letdown tape bag is attached to left forward most hard point in Helicopter with carabiner. Enough let down tape is pulled from bag and rigged to figure 8 to ensure the proper length during actual hook up to bracket. Rigged figure 8 is then taped to bag/box (eye facing toward cargo door) to secure it during flight. Spotter attaches end of let down line with carabiner to bag/box loops and locks barrel. Caution should be used to prevent crossing of letdown lines; this will ensure proper deployment of cargo.
- F. Spotter closes door, secures seat belt, attaches avionics, and prepares for flight.

3. APPROACH TO DEPLOYMENT SITE

- A. Recon area for hazards and confirm deployment site with pilot.
- B. Identify and check alternate site.
- C. Inform ground personnel to stay clear of cargo during deployment.
- D. Contact appropriate flight following authority (ATGS, HLCO, dispatch, etc.) prior to commencing the deployment sequence.
- E. PIC indicates, “one minute out from site, air speed below 40 kts, cargo sequence may begin.”
- F. Spotter removes seat belt, disconnects avionics, moves from seat, and attaches spotter tether carabiner to spotter bracket. Spotter displays hook up and emergency knife to either on board assistant or co-pilot, and receives thumbs up signal that hook up is correct. Spotter hooks into avionics and activates hot mike. From this point on all Spotter actions will be verbalized to Pilot.

3. HOVER POSITION

- A. Spotter moves to door and announces to Pilot “*door coming open*”, and then finalizes proper position over deployment site. Terminology will be: “*Left, Right, Forward, Back, Up, Down, and number of feet for each direction*”.
- B. PIC establishes hover over site at appropriate height. Spotter to both Pilots; “*We are over the spot, how is the power?*” SIC responds, “*Power is set and good*” PIC responds, “*I have the spot, you may proceed*”.

CAUTION: Spotter shall not move cargo outside the A/C until the Pilot announces “*Power is good*”.

4. CARGO DEPLOYMENT

- A. Spotter un-tapes figure 8 and pulls it toward door, attaches it to carabiner, and locks the barrel. **Make sure not to cross cargo lines.** Take up excessive slack between the cargo and bracket as you move cargo towards the door.

- B. Ease cargo out of door, lowering outside of step.
- C. Begin lowering cargo with positive control of letdown line; do not allow un-arrested descent of cargo. Keep Pilot informed of actions and progress of cargo descent:
 - “ *Cargo out the door*”
 - “ *Cargo halfway down*”
 - “ *Cargo on the ground, etc.*”

- D. When cargo is on the ground, unhook figure 8 from carabiner/bracket and remove letdown tape. Set the figure 8 in seat #1. Hold slack in line to prevent billowing and unhook let down line bag from hard point. Wrap excess letdown line around bag and throw clear of aircraft.

- E. Inform Pilot if more cargo is to be lowered. Pilot will determine whether to hold hover or orbit area until cargo is ready for subsequent deployment. If additional cargo is required, repeat steps A-D above. When cargo deployment is complete Spotter will verbalize to Pilot “*Lines are clear, closing door, unhooking Spotter tether, returning to seat, clear to depart*”.