

Salt Lake Helitack

Cargo Letdown Operations Plan

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Salt Lake Helitack

Cargo Letdown Operations Plan

All operational procedures as stated in the Interagency Helicopter Rappel Guide will be followed and adhered to as policy; specifically Chapter 7- Cargo Letdown Operations. Additionally the BLM National Aviation Plan will be followed and adhered to as policy; specifically Appendix 7-BLM Cargo Let Down Protocol. The appropriate appendices will be followed according to type and model of helicopter on contract. A Cargo Letdown Decision Matrix checklist (Appendix 1), GAR Risk Model (Appendix 2), Risk Assessment for Cargo Letdown (Appendix 3) will be utilized as a tool to aid the spotter and/or pilot in the decision process before commencing cargo letdown operations. All equipment certification, inspection and retirement intervals will be documented (Appendix 4-9). All cargo let down missions will be documented for record keeping (Appendix 7) and included in the annual use summary. A BLM cargo letdown trainee qualification record will also be utilized (Appendix 8). The BLM Cargo Letdown Protocols are also included (Appendix 9).

Introduction

“Helicopter cargo letdown” is defined as *the deployment of cargo from a hovering helicopter by the means of an approved webbing, descent device, and auxiliary equipment.* The Helicopter Cargo Letdown Procedures consist of material compiled from the private sector, bureaus, and agencies within the Department of Interior and USDA Forest Service. This operating plan will guide the user to utilize helicopter cargo letdown to accomplish a wide variety of tasks or projects safely and economically. Cargo letdown was designed to augment helicopter rappel operations; it is not a replacement for long-line operations. Exposure and risk assessment is addressed through documents appendix 1-3, including the Aviation Risk Management Workbook. All cargo let down operations will not commence until the Cargo Let Down Decision Matrix (Appendix 1) is completed and approved by a qualified spotter in conjunction with the pilot.

The West Desert District has contracted an AS-350 B3E (Brainerd Helicopters) for the fire contract based in Erda, Utah. Internal and external cargo letdown operations are approved for use with this helicopter and contract.

Applications

Cargo letdown operations expand the capability of the helicopter by delivering cargo on incidents and projects.

1. Allows external cargo delivery missions to be combined with other missions for increased safety and efficiency.
2. Initial attack equipment can be deployed directly on the fire line.
3. Helispot construction equipment can be placed on site.
4. Equipment can be placed on the fire line without excessive nets, swivels, and lead lines to be packed out.
5. First aid and rescue equipment can be delivered on site rapidly and safely.

6. Long distance cargo delivery could be more cost-effective and expedient due to faster air speed allowed with internal cargo.
7. Cargo could be delivered under a variety of conditions:
 - A. tall timber
 - B. steep hillsides
 - C. snag patches
 - D. rock slides
 - E. wind conditions beyond paracargo limits
 - F. no helicopter landing site available

Administrative Duties

1. The spotter will have sufficient training in helicopter service contract administration to ensure the following requirements are met:
 - a. Load calculations are being completed correctly.
 - b. Flight time and flight purpose is being documented for billing purposes.
 - c. Flight and duty hour restrictions are not being violated by pilot.
 - d. Accident/Incident/Safecom reports are completed when required.
 - e. Contractual problems are relayed to the contracting officer's representative or project inspector.
2. The spotter will coordinate all individuals involved. This includes:
 - a. Monitoring qualifications and training
 - b. Completing all necessary documentation and maintaining unit logs.
 - c. Spotter/pilot critiques are completed.
 - d. Problems and solutions are noted in the unit log.

Training

Cargo Letdown Spotter

1. Cargo letdown Spotter Trainee Requirements

To be considered for spotter training, the trainee must meet the following requirements: -

- a. Completion of S-372 Helicopter Manager and initiate Helicopter Manager Taskbook.
- b. Completion of National Incident Management System(NIMS) IS 700.
- c. Other recommended training, Basic Supervision for First Line Supervisors, M-410 or equivalent, Contracting Officer Representative Level I, CRM, Risk Awareness (A-205) Ride along on rappel and or cargo missions

2. Cargo-letdown Spotter Training and Qualification

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

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

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

3. Spotter Proficiency

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

4. Annual Spotter certification

- a. Must attend and successfully complete annual cargo letdown training.
- b. Simulate a deployment without error.
- c. Complete deployment of three loads of cargo without procedural error.
- d. Demonstrate knowledge of standard procedures of cargo letdown.
- e. Reference 4.1.2 for documentation requirements.

Spotter Standard Procedures

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

1. Pre-Flight Duties

- a. Prior to departure, the pilot(s) and involved personnel shall receive a briefing on mission objectives, communications, known hazards, and emergency procedures.

- b. Spotter puts on harness, ensures safety knife is attached to harness.
 - d. Spotter completes necessary pre-flight inspections.
 - e. Load calculations and manifests complete and posted.
 - e. Spotter completes necessary pre-flight inspections.
 - f. Prior to flight, the spotter must receive a spotter equipment check (see IHRG 7.6).

When ground personnel are unavailable, the spotter shall have the pilot perform this check. Positive communication between the spotter and pilot must occur to ensure spotter has attached their tether to an approved hard point.
2. Pre Deployment Briefing: Prior to any cargo letdown operation, the spotter will brief all personnel involved.
- a. Brief pilot with pertinent information affecting deployment mission and environmental concerns (weather, wind, terrain, landing areas, density altitude, etc.)
 - b. Pilot/spotter will brief on emergency procedures and verbal communications during deployment sequence.
 - c. Clear and concise communication between the pilot and the spotter will take place during the entire cargo letdown process. Communication must be completely understood by both the pilot and spotter.
3. Pre-flight Inspection: Each spotter shall conduct an equipment check prior to boarding the helicopter.
- a. All pockets; shirt and pants are emptied.
 - b. Aviator's protective helmet is properly fitted and secured. Avionics are operational and cord is long enough to provide sufficient length to accommodate spotter's movement in the cabin without interfering with cargo letdown line.
 - c. Collar turned up, fire shirt buttoned to top or nomex flight suit zipped up completely.
 - d. Sleeves down and over gloves.
 - e. Nomex/leather gloves on.
 - f. Harness correctly fitted and loose straps secured with no twists, tacked in accordance with IHRG Appendix O
 - g. Buckles secure and attached correctly.

- h. Leather boots. (Nomex will extend below boot tops)
- i. Tether connected to an approved attachment point.

NOTE: Take special care in checking correct buckle attachments and looking for loose ends of straps that could become entangled in the line and/or descent device.

4. Helpful Hints

- a. Maintain a taut letdown line at all times. DO NOT allow un-arrested descent.
- b. Attempt to minimize contact with fuselage, step, skid, or basket when deploying cargo.
- c. Use center-of-line indicators to help determine whether splitting the load is an option (reference Chapter 7.5.3 IHRG).
- d. The shadow from the load may be useful in determining height above ground.
- e. Keep helicopter control input to a minimum after descent begins to minimize load oscillations.
- f. Secure load behind rocks, logs, or bushes whenever possible on steep terrain to avoid rolling.
- g. If tight spin develops during letdown, accelerate letdown process as much as possible.
- h. All cargo containers must be manufactured with high strength, abrasion-resistant materials.
- i. Aircraft utilizing external cargo operations should minimize flight time with external cargo and maintain an air speed that allows for the external load to remain stable.
- j. Steel figure 8's will retain more heat than aluminum figure 8's.
Excessive heat buildup on the figure 8 could cause melting of letdown line during cargo deployment.

Eurocopter AS-350 Series Internal Cargo Let Down (125 pounds maximum)

Aircraft Configuration

1. Secure right rear door, open and locked position, remove right side pilot door.
2. Install necessary sill plates.

3. Remove co-pilot seat if necessary.
4. Secure all loose items, tighten and stow all unused seatbelts.

Internal Anchor and Cargo Configuration

Anchor Inspection

Internal Floor Anchor STC: SR00125LA-D

1. Inspect overall condition for cracks or deformities
2. Ensure all bolts are in place and tight.

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

1. Equipment will be inspected prior to use by a qualified spotter
2. Floor Anchor: Attach the rigged figure 8 to the forward attach point on the right side of the floor anchor. Extender strap may be used to move figure 8 away from the floor anchor.



Internal Cargo Procedures

A. Rigging and Loading Cargo

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

6. Spotter tells pilot, “Tether attached OK to depart,” Pilot Responds “Tether attached, departing.”

B. Pre-Cargo Sequence

1. Pilot(s) flies a reconnaissance of the area to look for hazards and works with spotter to select an appropriate cargo delivery site.
2. Contact appropriate flight following authority (ATGS, HLCO, dispatch, etc.) prior to commencing the cargo operation. Spotter communicates with flight following authority & pilot regarding number of loads to be deployed.
3. Inform ground personnel to stay clear of cargo during deployment.
4. Adjust radios as needed to ensure pilot and spotter communication will not be compromised by excessive radio chatter. Radios must remain on and dialed to the appropriate flight following frequency.
5. Where possible helicopter should maintain at least 50ft. clearance above any obstacles before starting a cargo operation.
6. If this is not possible and helicopter must descend below the canopy, the pilot shall maintain rotor clearance from all obstacles with a minimum of 1 and ½ rotor diameter.
7. Before starting cargo operations, A HOGE Power check is accomplished at an altitude comparable to the cargo site or greater. A Positive rate of climb must be established without exceeding aircraft limitations. Pilot states **“hover established, positive rate of climb, power is good.”**
8. Spotter responds **“Power is Good”**
9. Spotter activates hot mike if not done already
10. Cargo letdown pack must be connected to a hard point.
11. Spotter removes restraining straps from cargo, ensures remaining cargo is secure, and positions cargo in doorway. Spotter relays to pilot when rigging is complete.
12. Spotter finalizes proper position over cargo site. Using pilot’s perspective (left, right, forward, back, and up or down relative to altitude above the ground.)

C. Cargo Deployment Sequence

1. Spotter states to pilot, **“Cargo ready. How is the power?”**
2. Pilot **“powers good”**.
3. Spotter will communicate with pilot regarding adequate rotor clearance, power assessments, and cargo spot status throughout the cargo operation. Using pilot’s perspective (left, right, forward, back, and up or down relative to altitude above the ground).
4. Spotter states to pilot, **“Sending Cargo”** then eases cargo out the door, over the flight step and skid.
5. Begin lowering cargo with positive control of letdown line; do not allow un-arrested descent of cargo. Keep pilot informed of actions and progress of cargo descent:
 - **“Cargo out the door”**
 - **“Cargo halfway down”**
 - **“Cargo on the ground”**
6. When cargo is on the ground, unhook figure 8 from carabiner/Anchor and remove letdown line. Hold slack in line to prevent billowing and unhook letdown line bag from hard point. Wrap excess letdown line around bag and throw clear of aircraft stating “throwing bag outside of skid”

7. Inform pilot if more cargo is to be lowered. Pilot/spotter will determine whether to hold hover or orbit area until cargo is ready for subsequent deployment.
8. When cargo deployment is complete spotter states to pilot, **“Lines are on the ground, clear to depart.”**
9. Pilot responds **“lines on the ground, clear to depart.”**
10. Spotter states **“affirmative lines are clear, clear to depart.”**
11. Radio returned to normal operational mode and flight following authority is informed that cargo operation has been completed.

Eurocopter AS-350 series (Astar) External Cargo Let Down (300 pounds maximum)

Aircraft Configuration

1. Secure right sliding door, open and locked position, remove right side forward door.
2. Install necessary sill plates.
3. Secure all loose items, tighten and stow all unused seatbelts.

External Anchor and Cargo Configuration

Anchor Inspection

Internal Floor Anchor STC: SR00125LA-D

1. Inspect overall condition for cracks or deformities
2. Ensure all bolts are in place and tight.

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

1. Equipment will be inspected prior to use by a qualified spotter
2. Loaded cargo container is set up in the front of the helicopter.
3. Attach one end of the cargo strap to the cargo container and the other end to the swivel. Light weight nets (tuna) are attached directly to the swivel.
4. External cargo must be attached to the belly hook, with hardware that meets flight manual specs.
5. 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.
6. Rig letdown line through figure 8 and attach a carabiner to the hard loop on the free end of the line.
7. Anchor-Attach the rigged figure 8 to the forward attach point on the left side of the floor anchor. Attach locking carabiner on rigged letdown line to the Velcro loop on the breakaway strap. Extender strap may be used to move figure 8 away from the floor anchor.
8. Lock off letdown line on figure 8.
9. Cargo letdown pack must be connected to an appropriate hard point.





External Cargo Procedures

A. Pre-Cargo Sequence

1. Spotter connects tether, plugs into avionics, completes necessary external cargo checks, boards aircraft, and secures seatbelt.
2. Spotter tells pilot, **“Tether attached, load on the hook OK to depart,”**
3. Pilot Responds **“Tether attached, load on the hook, departing.”**
5. Pilot(s) flies a reconnaissance of the area to look for hazards and works with spotter to select an appropriate cargo delivery site.
6. Contact appropriate flight following authority (ATGS, HLCO, dispatch, etc.) prior to commencing the cargo operation. Spotter communicates with flight following authority & pilot regarding number of loads to be deployed.
7. Inform ground personnel to stay clear of cargo during deployment.
8. Adjust radios as needed to ensure pilot and spotter communication will not be compromised by excessive radio chatter. Radios must remain on and dialed to the appropriate flight following frequency.
9. Where possible helicopter should maintain at least 50ft. clearance above any obstacles before starting a cargo operation.
10. If this is not possible and helicopter must descend below the canopy, rotor clearance must meet the current standards in the IHOG.
11. Before starting cargo operations, A HOGE Power check is accomplished at an altitude comparable to the cargo site or greater. A Positive rate of climb must be established without exceeding aircraft limitations. Pilot states **“hover established, positive rate of climb, power is good.”**
12. Spotter responds **“Power is Good”**
13. Spotter activates hot mike if not done already

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

B. Cargo Deployment Sequence

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

Cargo Delivery Emergency Procedures: Internal Cargo

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

Types of Helicopters Emergencies

There are two basic categories of emergencies:

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

Immediate Response Emergencies:

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

Examples of Possible Emergencies:

- Engine Failure
- Tail Rotor Failure
- Hard over of controls
- Engine over speed/driveshaft failure
- Compressor Stall (Single engine)
- Governor Failure (Single Engine)

Challenge/Response Communications - Immediate Response Emergency

PILOT: “Cut, Cut, Cut”

SPOTTER:

A. If cargo is still secure:

- state “**Clear**”
- Immediately take seat and fasten seatbelt
- Aircraft will depart immediately and comply with Pilot Operating Handbook (POH) direction.

B. If the cargo process has begun and the cargo has been unsecured:

• State “**Clearing Cargo**” and:

a. If cargo is still in the aircraft:

- Re-secure cargo or Cut line directly above cargo container and Jettison cargo out open door.
- State “**Clear**”
- Take seat and buckle-up.

b. If cargo has been delivered outside the aircraft:

- Cut line
- State “**Clear**” when the cargo container has cleared the aircraft
- Take seat and buckle-up.

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

Delayed Response Emergencies:

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

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

Examples of Possible Problems:

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

Challenge/Response Communications - Delayed Response Emergency Events of a **mechanical**

C. If you are in mid sequence (cargo has been delivered past the skids)

- Continuation of the cargo delivery may be permissible if circumstances warrant.
- Once cargo is on the ground the spotter will cut the line freeing the aircraft for immediate departure and compliance with POH direction

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

A. If relocation is not required:

- Once the pilot and spotter concur that the event is no longer of concern cargo operations can resume.

B. If relocation is required:

- If cargo is still secure:

- a. Spotter states **“Clear”**
- b. Immediately take seat and buckle-up.
- c. Aircraft will depart immediately and comply with Pilot Operating Handbook (POH) direction.

- If cargo has been unsecured but not delivered outside the aircraft:

- a. The spotter will state **“Clear”**
- b. Secure the cargo as quickly as possible
- c. Take seat and buckle seatbelt.

- If you are in mid sequence (cargo has been delivered past the skids)

- a. Continuation of the cargo delivery may be permissible if circumstances warrant.
- b. Once cargo is on the ground the spotter will cut the line freeing the aircraft for immediate departure and compliance with POH direction

Cargo Delivery Emergency Procedures: External Cargo

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

Types of Helicopters Emergencies

There are two basic categories of emergencies:

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

Immediate Response Emergencies:

There are a limited number of emergencies that fall into this category. In the cargo delivery environment these emergencies are characterized by a need to depart the hover

without delay. In this type of emergency, the possibility of affecting a positive outcome will be impacted by the ability to jettison lines quickly.

Examples of Possible Emergencies:

- Engine Failure
- Tail Rotor Failure
- Hard over of controls
- Engine over speed/driveshaft failure
- Compressor Stall (Single engine)
- Governor Failure (Single Engine)

Challenge/Response Communications - Immediate Response Emergency

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

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

SPOTTER:

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

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

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

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

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

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

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

Delayed Response Emergencies:

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

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

Examples of Possible Problems:

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

Challenge/Response Communications - Delayed Response Emergency

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

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

- Spotter states **“Clear”** Cargo can be jettisoned at pilot and spotters discretion
- Immediately take seat and buckle-up.
- Aircraft will depart immediately and comply with Pilot Operating Handbook (POH) direction.

B. If cargo process has started, break away strap is hooked **“hard”** w/ figure 8 locked off and cargo is still on the hook.

- State **“Clearing Breakaway Strap”**
- Disconnect Breakaway strap from carabineer cut letdown line below the figure 8
- State **“Clear- “Jettison Load”** at pilot and spotters discretion
- Immediately take seat and fasten seatbelt

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

- State **“Clearing Breakaway Strap”**
- Disconnect Breakaway strap from carabineer or cut letdown line below the figure 8
- State **“Clear- “Jettison Load”** at pilot and spotters discretion
- Immediately take seat and fasten seatbelt

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

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

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

A. If relocation is not required:

- Once the pilot and spotter concur that the event is no longer of concern cargo operations can resume.

B. If relocation is required:

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

Appendix 1 Cargo Letdown Decision Matrix

Mission Conditions	Yes	No
Is this CLD mission necessary? (pilot and spotter in agreement)		
Is this a time critical mission?		
Site Conditions		
Does vegetation exceed limitations?		
Is there a helispot location nearby that could be utilized instead?		
Do the main and tail rotors have adequate clearance from terrain and trees?		
Is terrain conducive to receiving cargo? (Too steep? Etc.)		
Aircraft/Pilot		
Are pilot and aircraft approved for the mission?		
Pilot completed pre-flight checks?		
Intercom and radio communications set and checked?		
Load calculation completed for the CLD deployment site?		
Remove or secure all loose items within the aircraft?		
Pilot briefed for the intended mission and communication procedures?		
Weather/Time		
Are winds within an acceptable range to perform a CLD operation?		
Is there enough time to complete the operation before sunset (pumpkin time)?		
Spotter		
Is the spotter qualified and proficient to perform this operation?		
Preflight walk around check of helicopter performed by spotter?		
Spotter checks completed?		
Spotter harness and tether in working order and installed correctly?		
Spotter PPE utilized?		
Completed a pre-deployment briefing to all parties involved?		
Completed an emergency procedures briefing with the pilot?		
Equipment		
Is all CLD equipment approved and in good working order?		
Internal cargo rigged and checked by spotter?		
Operations		
All personnel briefed for the operation, emergency plan in place?		
Ground personnel briefed? (Remain away from site)		
Communication with pilot is good?		
High hover power check is good, positive rate of climb established. Power is Good?		
Completed By:		
CLD Operation Approved By:		

**Appendix2
GAR Risk Model**

Operation:	Scheduled Date:				
Objective(s):					
Supervision					
Circle the number as appropriate					
Supervisor has perfect knowledge about the mission, personnel, capabilities and limitations, and is able to apply the appropriate control to minimize risk	<table style="width: 100%; border: none;"> <tr> <td style="width: 15%; text-align: center;"><</td> <td style="width: 15%; text-align: center;">7 8 9 10</td> <td style="width: 15%; text-align: center;"><input type="checkbox"/></td> <td style="width: 55%; padding-left: 10px;">Supervisor has little knowledge about the mission, personnel, capabilities and limitations, and lacks skill, knowledge or ability to apply the appropriate control to minimize risk.</td> </tr> </table>	<	7 8 9 10	<input type="checkbox"/>	Supervisor has little knowledge about the mission, personnel, capabilities and limitations, and lacks skill, knowledge or ability to apply the appropriate control to minimize risk.
<	7 8 9 10	<input type="checkbox"/>	Supervisor has little knowledge about the mission, personnel, capabilities and limitations, and lacks skill, knowledge or ability to apply the appropriate control to minimize risk.		
Planning					
There is a well-designed plan that is reviewed and revised as needed to meet the demands for safety and efficiency and to account for adaptation. Time is well managed.	<table style="width: 100%; border: none;"> <tr> <td style="width: 15%; text-align: center;"><</td> <td style="width: 15%; text-align: center;">7 8 9 10</td> <td style="width: 15%; text-align: center;"><input type="checkbox"/></td> <td style="width: 55%; padding-left: 10px;">There is no plan or the plan doesn't address many current adaptations made in response of demands for efficiency. Time constraints have a strong effect on ability to plan.</td> </tr> </table>	<	7 8 9 10	<input type="checkbox"/>	There is no plan or the plan doesn't address many current adaptations made in response of demands for efficiency. Time constraints have a strong effect on ability to plan.
<	7 8 9 10	<input type="checkbox"/>	There is no plan or the plan doesn't address many current adaptations made in response of demands for efficiency. Time constraints have a strong effect on ability to plan.		
Contingency Resources					
Reliable alternative equipment and personnel are available, easily accessed and informed about the mission requirements	<table style="width: 100%; border: none;"> <tr> <td style="width: 15%; text-align: center;"><</td> <td style="width: 15%; text-align: center;">7 8 9 10</td> <td style="width: 15%; text-align: center;"><input type="checkbox"/></td> <td style="width: 55%; padding-left: 10px;">The outcome depends on the equipment and personnel assigned completing the mission perfectly. Failure is not an option</td> </tr> </table>	<	7 8 9 10	<input type="checkbox"/>	The outcome depends on the equipment and personnel assigned completing the mission perfectly. Failure is not an option
<	7 8 9 10	<input type="checkbox"/>	The outcome depends on the equipment and personnel assigned completing the mission perfectly. Failure is not an option		
Communication					
Interpersonal communications are clear and there is a high level of trust in the organization. Adequate personnel and technology are available to relay information accurately to those who make the decisions	<table style="width: 100%; border: none;"> <tr> <td style="width: 15%; text-align: center;"><</td> <td style="width: 15%; text-align: center;">7 8 9 10</td> <td style="width: 15%; text-align: center;"><input type="checkbox"/></td> <td style="width: 55%; padding-left: 10px;">There is low trust in the organization or the personnel/communication equipment is unreliable based on the expected needs for the mission.</td> </tr> </table>	<	7 8 9 10	<input type="checkbox"/>	There is low trust in the organization or the personnel/communication equipment is unreliable based on the expected needs for the mission.
<	7 8 9 10	<input type="checkbox"/>	There is low trust in the organization or the personnel/communication equipment is unreliable based on the expected needs for the mission.		
Team Selection					
Multiple personnel with skill, knowledge and ability are available to fulfill the requirements of the mission. Selection and preparation are done well in advance so there is plenty of time for personnel to	<table style="width: 100%; border: none;"> <tr> <td style="width: 15%; text-align: center;"><</td> <td style="width: 15%; text-align: center;">7 8 9 10</td> <td style="width: 15%; text-align: center;"><input type="checkbox"/></td> <td style="width: 55%; padding-left: 10px;">Only one person is available and the success of the mission depends on that person juggling many responsibilities to squeeze this mission into the work schedule. Additional time will be donated to keep up with the workload</td> </tr> </table>	<	7 8 9 10	<input type="checkbox"/>	Only one person is available and the success of the mission depends on that person juggling many responsibilities to squeeze this mission into the work schedule. Additional time will be donated to keep up with the workload
<	7 8 9 10	<input type="checkbox"/>	Only one person is available and the success of the mission depends on that person juggling many responsibilities to squeeze this mission into the work schedule. Additional time will be donated to keep up with the workload		

get personal and job related demands addressed.		
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Team Fitness		
Personnel are trained, proficient, healthy, and rested prior to starting the mission. Personal issues are addressed and little external stress is being exerted.	< 7 8 9 10	<input type="checkbox"/> Personnel lack one or more critical component in their training. These persons have been squeezing in many additional duties as assigned distracting them from their proficiency or personal life.
Environment		
Weather and visibility are conducive to the best possible chance for success in the mission. Operational tempo is appropriate for the mission	< 7 8 9 10	<input type="checkbox"/> Winds are unpredictable, temperature is extreme, low ceilings and visibilities, precipitation, sun angle creates strong shadows, etc. Mission tempo is too low or high.
Mission Complexity		
A single agency is involved with personnel from the same unit who regularly work together. Mission is straight forward and covered by standard operating procedures.	< 7 8 9 10	<input type="checkbox"/> Multiple agencies are involved in a mission that defies definition or has ever been attempted. Personnel are new to each other and come from different cultures. Many leaders are emerging and working toward different objectives.
Mission Total		
Benefit Statement:		
GAR Assessment Completed by:		
Operation Approved by:		Title: Date:

GREEN ZONE(1-35)	AMBER ZONE(36-60)	RED ZONE(61-80)
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Appendix 3 Risk Assessment for Cargo Letdown

Chart 3-2: Risk Assessment			HAZARD PROBABILITY				
			Frequent	Probable	Occasional	Remote	Improbable
Matrix			A	B	C	D	E
			Catastrophic I High			Medium	
EFFECT	Critical	II	Serious			Medium	
	Marginal	III	Serious	Medium(2)			
	Negligible	IV	Medium	Low(1)			

Assignment: Internal Cargo Let-Down		Date: 2009		
Pre-Mitigation hazards rate out as: Medium (2)				
Describe Hazard:		Probability (A-E)	Effect (I-IV)	Risk Level
1. Aircraft Performance, allowable weight limits		E	I	Med (2)
2. Unsecured items		E	I	Med (2)
3. Mechanical failure		E	I	Med (2)
4. Equipment malfunction		E	I	Med (2)
5. Environmental-hot, high, gusty winds		C	II	Serious (3)
6. Unqualified personnel		E	II	Low (1)
Mitigation Controls:		Probability (A-E)	Effect (I-IV)	Risk Level
Post-Mitigation hazards rate out as: Low (1)				
1. Aircraft Performance – use HOGE performance charts, proper fuel load, c/g calculation, load calc complete, manifest complete/correct		E	II	Low (1)
2. Unsecured items—secure loose items, clear aircraft of unnecessary items, double check		E	II	Low (1)
3. Mechanical failure—power checks complete, emergency procedures known and followed, follow IHRG, qualified mechanic		E	II	Low (1)
4. Equipment malfunction—complete log book as per IHRG, inspect equip as per IHRG complete spotter checks		E	II	Low (1)
5. Environmental—OGE power check, check weather forecast, identify/utilize alternate sites		D	III	Low (1)
6. Unqualified personnel—check pilot card, CLD Spotter carded and proficient		E	III	Low (1)
Operation Approved by:		Title:	Date:	

Appendix 8
BLM Cargo Letdown Trainee Qualification Record

INSTRUCTIONS FOR COMPLETING QUALIFICATION RECORDS

Each requirement or task for each qualification record shall be completed under the direct supervision of a qualified HERS/HCLS and signed and dated by the evaluating Spotter Trainer. Comments should be included in the space provided to ensure appropriate documentation of performance and to provide feedback to trainees. The number of evaluations of each task is not limited to the number of signature lines provided within the Evaluator/Date column.

CARGO LETDOWN TRAINEE:

TRAINEE'S NAME	DUTY STATION	PHONE NUMBER

TRAINEE RECOMMENDED BY:

NAME	TITLE	PHONE NUMBER

QUALIFICATION RECORD INITIATED BY:

NAME	TITLE	PHONE NUMBER

Helicopter Make/Model:

Notes:

SIGNATURE	DATE

Position:		CARGO LETDOWN SPOTTER	Trainee:		
TASK: CARGO LETDOWN GROUND TRAINING			Evaluator	Date	Comments
1.	Review IHRG Sections 3,4,7				
2.	Equipment inspections procedures				
3.	Documentation of equipment				
4.	Discuss model specific procedures				
5.	Review Go-No Go checklist & Discuss mission specific Risk Mgt.				
6.	Discuss CRM and spotter directions with pilot				
7.	Discuss emergency procedures with pilot present				
TASK: CARGO LETDOWN SIMULATOR (optional)			Evaluator	Date	Comments
1.	Tower, simulator briefing				
2.	Cabin configuration and rigging (model specific)				
3.	Verbalization with pilot				
4.	Proper equipment checks				
5.	Cargo configuration				
6.	Cargo equipment orientation				
7.	Rigging and deploying cargo				
8.	Maintain visual on cargo				
9.	Emergency procedures				
TASK: CARGO LETDOWN MOCK-UPS			Evaluator	Date	Comments
1.	Proper Briefing crew /pilot				
2.	Proper rigging /model specific				
3.	Verbalization with pilot				
4.	Proper equipment checks				
5.	Cargo configuration				
6.	Cargo equipment orientation				
7.	Maintain control during deployment				
8.	Maintain focus and control of mission				
9.	Emergency procedures				
TASK: CARGO LETDOWN INITIAL LIVE HELICOPTER			Evaluator	Date	Comments
1.	Proper rigging /model specific				
2.	Proper Briefing crew /pilot				
3.	Proper Equipment Checks				
4.	Proper Verbalization				
5.	Ensure power check completed				

Position:		CARGO LETDOWN SPOTTER	Trainee:		
TASK: CARGO LETDOWN GROUND TRAINING		Evaluator	Date	Comments	
6.	Select adequate cargo letdown site and alternate sites and notify ground resources of mission (Stay Clear)				
7.	Maintain aircraft and rotor clearance throughout sequence				
8.	Maintain visual on cargo letdown line and cargo				
9.	Maintain controlled decent of load to the ground				
10.	Maintain focus and control of mission				
TASK: CARGO LETDOWN CHECKRIDE		Evaluator	Date	Comments	
1. Configure helicopter with proper Cargo rigging and perform appropriate equipment checks					
2. Maintain communication with appropriate flight following authority					
3. Identify flight hazards					
4. Identity adequate cargo letdown and alternate emergency sites					
5. Assess helicopter performance capabilities at local temp. and altitude, perform powercheck					
6. Assist pilot to position helicopter over cargo letdown site					
7. Deploy cargo using appropriate verbiage with pilot					
8. Maintain clearance of cargo from all obstacles					
9. Maintain aircraft and rotor clearance throughout cargo sequence					
10. Deploy cargo maintaining controlled decent at all times					
11. Establish communication with firefighters on the ground. Report to appropriate flight following authority					
12. Debrief with HERS/HCCS					

TASK: CHECKRIDE PROCEDURAL ERROR FREE CYCLES		Evaluator	Date	Comments
1.	LOW <75 AGL Low < 75' AGL			
2.	LOW <75 AGL Low < 75' AGL			
3.	Medium 75' to 150' AGL			
4.	Medium 75' to 150' AGL			
5.	High Above 150" AGL			
6.	Low - Typical Terrain			
7.	Medium - Typical Terrain			
8.	Medium - Typical Terrain			
9.	High-Typical Terrain			
10.	High-Typical Terrain			

CARGO LETDOWN SPOTTER TRAINEE APPROVAL RECOMMENDATION

Additional Cargo Letdown Training Recommended			
	NO	YES	DATE

Recommendation:

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Successful Completion of Cargo Letdown Training			
	NO	YES	Date

Annual Recertification		
	Date	Certifying Official

Comments:

Check Spotter Name	Signature	Date

Appendix 9

BLM National Aviation Plan Cargo Letdown Protocol

Cargo letdown is a procedure used to lower cargo out of a hovering helicopter to the ground with the use of a nylon line and rappel anchor. This procedure is used by helitack programs across the country to get needed equipment and supplies to the ground when conventional methods are not the most efficient option.

National BLM approval is required to host a cargo letdown program. Requests for approval are initiated by a state office to the NAO with the final approval made by the Division Chief, Aviation.

NAO approval allows for internal cargo letdown operations but, external cargo letdown (off the hook) operations may also be authorized. Initial approval will be based upon indicated need and limited to one field season. Subsequent conditional approval must be requested after the initial field season and validated based on proper utilization and justification of continued need. Approved cargo letdown programs will be re-evaluated in conjunction with new helicopter contract solicitations. Several administrative procedures need to be addressed as part of the request for approval; the state office must supply the NAO with the following documents:

- 1.** Initial justification to include nomination of one Helicopter Cargo Letdown Spotter Trainee candidates (HCLS(T)).
- 2.** Request for Contract Modification from COR to 2. NAO to:
 - a)** Provide for a contractor purchased cargo letdown anchor. Costs to the contractor would be recovered in an adjusted Daily Availability rate negotiated by the CO.
 - b)** Add additional “Special Pilot Requirements for Cargo Letdown” language.
- 3.** Approved copy of the complete Helibase Operations Plan prior to implementation.
- 4.** Cargo Letdown Operations Plan. This plan would supplement the Helibase Operations Plan. The Cargo Letdown plan should describe all aspects of the letdown program to include:
 - a)** Risk Management mitigation measures
 - b)** Decision Matrix (under what parameters will this operation be conducted
 - c)** Detailed operational procedures
 - d)** Detailed equipment and configuration descriptions
 - e)** Equipment certification/inspection/retirement intervals and documentation
 - f)** Personnel training, experience and proficiency f) requirements and record-keeping
 - g)** Letdown mission documentation and record-keeping
 - h)** Year-end statistical data on form “BLM Annual Helitack Data Master (June 2010).xlsx”. The form is available for download on the BLM NAO website,

Aircraft Operations, Helicopters, at:
<http://www.blm.gov/nifc/st/en/prog/fire/Aviation/Airops/Helicopters.html>

- i)** Completed copies of all BLM Cargo Letdown Spotter Trainee Qualification Record will be sent to the BLM state aviation manager (SAM) and the BLM helicopter program manager annually.

The NAO will provide assistance in arranging for Pilot and HCLS(T) certification as well as help with obtaining necessary required equipment.

The general operational procedures for cargo letdown are established in the *Interagency Helicopter Rappel Guide* (IHRG). This document provides additional direction to BLM cargo letdown operations.

BLM Cargo Letdown Operations will be conducted in accordance with the IHRG, specifically the applicable portions of:

- 1.** Chapter 3 Equipment
- 2.** Chapter 4 Documentation
- 3.** Chapter 7 Cargo Letdown Operations
- 4.** Appendix B Model Specific Cargo Procedures
- 5.** Appendix E Spotter Training.

Notwithstanding the *IHRG* the BLM also requires that:

- 1.** To be considered for cargo letdown spotter training, the trainee must:
 - a.** Be a fully qualified Helicopter Manager.
 - b.** Be a current member on an exclusive use helitack crew.
 - c.** Meet the prerequisite experience, training, and currency requirements outlined in the *Interagency Standards for Fire and Fire Aviation Operations* “Exclusive Use Fire Helicopter Position Requisites” for the position they encumber.
 - d.** Only the helitack supervisor, assistant and/or squad leader positions will be qualified as cargo letdown spotter.
 - e.** Any deviation from these additional BLM requirements must be approved in writing by the SAM with a courtesy notification to the NAO Helicopter Program Manager.
 - f.** Initial cargo letdown training shall be conducted by a DOI OAS training specialist or a fully qualified spotter (HERS/HCLS). The DOI AM training specialist or designee cargo/rappel check spotter (is responsible for conducting the final initial check ride and certification of a HCLS(T).
 - g.** When coordinating for and during training it is important that clear communications are maintained between the designee trainers (if utilized), the DOI OAS training specialist and the BLM Helicopter Program Manager.

- Each component of training (tower, mock-up, and live helicopter) may take one to two full days to satisfy the training requirements; this may vary based on the number of and progression of students. Requesting unit and trainees must be prepared to commit to the necessary time frames and associated expense when entering into agreement with Trainers.
- h.** This training is performance based and trainees will only move forward as specific training targets are met. It must be understood that there is the potential that a selected trainee could fail to complete the training due to inadequate performance.
 - i.** When utilizing the *IHRG*, Trainers will address only information directly associated with Cargo Letdown training and will not cover rappel specific operations unless authorized by NAO.
 - j.** Tower training (if utilized) can be generic. Mock-ups and live cargo letdown training shall be helicopter model specific to the aircraft utilized by the trainee and will follow the current model specific cargo letdown procedures in the *IHRG*.
 - k.** All trainees will utilize the attached “BLM Cargo Letdown Spotter Trainee Qualification Record” to assure all aspects of training are completed as well as for record keeping purposes. This documentation shall include further training recommendations and a clear picture of the trainee’s current level of competence.
 - l.** Recurrency: Each year, to re-qualify, a spotter must complete:
 - Attend and/or participate as an instructor at annual helicopter cargo letdown training.
 - Complete deployment of three loads of cargo from the helicopter to the satisfaction of the appropriate agency certifying official. Subsequent re-qualification certification may be conducted by a qualified spotter (USFS or DOI). Typical terrain shall be utilized for at least one of the three loads.
2. To be considered for approval as Helicopter Cargo Letdown Check Spotter (HCCS), the trainee must:
- a)** Be nominated by the SAM to the NAO.
 - b)** Be a current helitack supervisor or assistant on an exclusive use helitack crew.
 - c)** Meet the position/prerequisites for check spotter in *IHRG* 7.4.2.
 - d)** Meet the prerequisite experience, training, and currency requirements outlined in the *Interagency Standards for Fire and Fire Aviation Operations* “Exclusive Use Fire Helicopter Position Requisites”.
 - e)** Subsequent recurrent certification may be conducted by a qualified Check spotter (USFS or DOI) with the concurrence of the respective SAM.
3. Pilots shall meet all the following requirements:
- a)** Meet the appropriate requirements of the procurement document to include having logged additional experience as pilot-in-command as follows:

- 50 hours -- Total hours in make, model and series offered.
 - 25 hours -- Rappel, cargo letdown or long line requiring precision placement, last 12 months.
- b)** Annually attend a cargo letdown training/recurrency training session. This training shall be conducted and documented by a qualified spotter and will include:
- Briefing and familiarization on letdown bracket and hard points for the specific model.
 - Seating arrangements for cargo and spotters.
 - Cargo placement/location and deployment sequence and method.
 - Exit procedures and sequence.
 - Perform a minimum of six ground mockups in the aircraft model to be used, including rigging the aircraft for cargo letdown mission and deploying cargo.
 - Briefing on any peculiarities of the specific model.
 - Demonstrate ability to operate helicopter during three cargo letdown sequences.
 - Demonstrate ability to work with spotter.
- c)** Upon meeting the above requirements, the pilot may be approved for helicopter cargo letdown operations by a DOI AM or USFS helicopter inspector pilot.
- d)** The pilot shall maintain currency in helicopter cargo letdown flying at the same frequency required of the spotter (every 14 days). If this cannot be accomplished every 14 days, a proficiency flight must be completed prior to any actual operational mission.
- e)** The helicopter must meet the requirements of the departmental manual and the procurement document, as appropriate.
- f)** All cargo letdown equipment will be approved for use in accordance with the requirements outlined in the *IHRG*.

Please contact National Helicopter Program Manager, Bryan Bitting, at (208) 387-5173 if you have questions or require assistance.