

# Best Practices

## Helicopter Association of Canada Mountain Flying Training

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## 1. Document Control Sheet

Contact for Enquires and Proposed Changes

If you have any questions regarding this document please contact the document controller:

Name: Helicopter Association of Canada Mountain Flying Training Best Practices Chair

Designation: Chair for the Sub-Committee Mountain Flying Training

If you have suggestions for improving this document forward your recommendations to Helicopter Association of Canada Chair of the Air Taxi Committee.

## 2. Record of Issues

Issue No	Issue Date	Nature of Amendment
1.0	June 2012	Compiled Draft
1.1	September 2013	Final DRAFT Original

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## 3. Introduction

### 3.1 Purpose

Since operational parameters of Mountain Flying vary considerably from one company to another, these guidelines do not purport to be complete nor are they universally applicable.

These best practices are meant to serve as guidance for helicopter operators when developing and maintaining their respective training programs for Mountain Flying.

Individual operators remains responsible for tailoring their company policies to the experience and aptitude of individual pilots, the type of equipment operated, the prevailing geographic and climatic conditions of the local operational environment and other particulars, specific to each operator and/or operation.

### 3.2 Scope

These best practices are intended to be reviewed and understood by HAC Members, operators, and clients of operators involved with Mountain Flying operations.

### 3.3 Document Layout

The HAC Mountain Flying Training Best Practice document is divided into sections. Each section is divided into sub-sections. Each section and sub-section is numbered using incremental decimal numbering.

## 4.0 Definitions

**Backlash:** Wind rushing up and over a sheer face with an abrupt square cornered top that changes 180° in direction.

**Contour crawl:** Flight technique in order to find mountain winds

**Downflow wind:** Wind that has a descending rate of speed

**Downflow turbulence:** Turbulence caused by the wind tumbling once it breaks the top of a hill, building or structure.

**Line of Demarcation:** The line at which wind transitions from a smooth laminar flow to rough, turbulent air.

**Mechanical turbulence:** Turbulent wind that is formed as wind passes over rugged terrain, structures, buildings etc.

**Mountain Flying:** Flight in disturbed air over terrain including variables such as altitude, elevation, temperature and irregular surfaces.

**Mountain reconnaissance:** Flight techniques used to gather information about your landing zone.

**Sheer Zone:** The point at which two or more winds meet

## 5.0 Qualifications

### 5.1 Mountain Training Pilot Qualifications

Training pilot selection for mountain flying is the responsibility of the company Chief Pilot. Below are some considerations when selecting a pilot for this type of training:

- Past experience in mountainous operations
- Minimum 2000 hours helicopter Pilot-in-Command
- 1000 hours mountain time
- Prior training experience
- Date of mountain training course, location and Instructor
- Total time on aircraft to be used
- Past experience in winter operations (if relevant)
- Past experience in geographical region. i.e. Coastal vs Interior

### 5.2 Candidate Qualifications

A pilot being introduced to mountain flying should be able to instinctively fly the aircraft before they are introduced to more advanced mountain flying techniques and should be recommended by the company Chief Pilot for advanced training.

## 6.0 Training

### 6.1 Training time allotted

#### Initial

Ground School: Minimum 8 hours

Flight Training: Minimum 5 hours (\*or to competency)

\*competency must be demonstrated to a pilot with the requisite training pilot qualification who should not be the candidate's initial training pilot.

### 6.2 Recurrent

Ground School: Minimum 30 min

Flight Training: must demonstrate proficiency to training pilot

### 6.3 Training records

Training records should be filled out in detail by the training pilot. Both pilots must sign this document. Training records should contain a form of marking system similar to the company's existing training system.

Debrief must take place after the flight to address any issues or concerns.

## 7.0 Training Syllabus

Training Syllabus should include the following;

### 7.1 Wind

- How it flows over/through terrain
- How it can cause a significant increase and decrease in lift
- The relation between windspeed/terrain and the line of demarcation
- How to find the line of demarcation
- Where to find:
  - Turbulent air (lee side of terrain)
  - Laminar flow (windward side of terrain)
- Down-flow and Up-flow wind
  - Where to find them
- Wind finding (see Recces)
- Prevailing winds vs. Local Winds
- Glaciers and down-flowing winds

### 7.2 Weather

- Visibility issues
  - Summer
  - Winter
- Icing
- Illusions
  - Rain on the windscreen
- Leaving an 'out' to the valley with the onset of weather
- Using ICAO lapse rate to find temperatures at altitude

### 7.3 Aircraft performance

- Effects of Density Altitude on performance
- RFM charts
  - OGE vs IGE charts
    - What to use and when
- LTE
- Vortex ring state
- Power/Weight management

### 7.4 Topography

Candidate must demonstrate the ability to assess, land, T/O and fly safely around these distinctive features.

- Saddles
- Cirques
- Ridges



- Shoulders
- Glaciers and snowfields
- Canyons
- Pinnacles

### 7.5 Reconnaissance

Assesses the area for wind, viability of the LZ, approach, departure and rejection path.

- Type
  - Circle
  - Figure 8
  - Contour crawl
- Airspeed control
- Altitude control
- Trim control
- Eye level review of LZ
- Wind finding
- Using terrain as an advantage
- Identifying a suitable LZ
- Always have an 'out'
- All turns away from the hill
- Obstacles on approach

### 7.6 Mountain Approach

- Commitment points
- Overshooting
- Using terrain as an advantage
- Know where your commitment point is
- Always have an 'out'
- Power check (Torque Check)
- Loading the disc
- Different styles depending on circumstances

### 7.7 Mountain Departure

- Do not depart uphill into the mountain
- Assure A/S and height are sufficient before turning downwind
- Acquire A/S as soon as possible over acceptable terrain

### 7.8 Rejected landings

- Why we reject a landing
  - Wind issues
  - LZ issues (not level, too close to obstacles etc.)

- Reference issues (winter)
- When to reject

### 7.9 Reference management

- Never leave a reference in bad weather
- Winter flying (snowball, whiteout, overcast days etc.)
- Visibility limits will decrease in glaciated areas

### 7.10 Airmanship

- Cross saddles and ridges at an angle to keep an 'out' readily accessible

### 7.11 LTE

- A very real danger of high altitude operations is the threat posed by running out of tail rotor authority. An unwanted yaw will require significant countering pedal which can cause a sudden torque spike and an overpitched condition.
- Crosswind operations can reach a point where the tail rotor has insufficient pitch reserve to create an appropriate counter force. It is for this reason-aircraft manufacturers include in their performance charts information that limits the A/C gross weight when operating out of wind.
- When operating in the mountains at higher altitudes, and where conditions allow, approach with the wind on the anti-torque pedal's side. This will reduce the amount of pedal input and power robbed.

## Appendix A Training Record Sample

**PILOT TRAINING RECORD**

E -	Exceeds
S -	Satisfactory
S/B -	Satisfactory W/Briefing
U -	Unsatisfactory

**Mountain Training** Initial € Recurrent € (Check ✓)

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Licence: \_\_\_\_\_ Training Pilot: \_\_\_\_\_

Pre-flight \_\_\_\_\_ Flight: \_\_\_\_\_ Post-flight: \_\_\_\_\_ Type & Reg: \_\_\_\_\_

	Check Details	S	S/B	U	E	Comments
<b>1.Pre Flight</b>	A. Planning for operations in Mountainous terrain					
	C. Density altitude					
	D. Aircraft performance					
	E. Weather & Wind check					
<b>2.Wind</b>	A. Wind Findings & Assess Landing Areas					
	B. A/S & ALT Control in Turns					
	C. Assessing line of demarcation					
	D. Approach and Departure Paths considering wind					
	E. Recognizing down flow & up flow winds					
	Other					
<b>3.Reconnaissance</b>	A. Wind Finding					
	B. Landing Zones					
	C. Approach & Departure Paths					
	D. Using available terrain					
	E. Control A/S and ALT					
	F. Eye level pass for suitability					
	Other					
<b>4. Approach and Departures</b>	A. Commitment points					
	B. Overshoots/Rejected landings					
	C. Landing & Takeoff profiles for given terrain					
	D. Power checks					
	E. Heavy Loads					
	F. Keeping an "OUT"					
<b>5. Topography</b>	A. Saddles					
	B. Ridges					
	C. Cirques					
	D. Pinnacles					
	E. Glaciers and Snowfields					
	F. Canyons					
<b>6. Reference Management</b>	A. Whiteout conditions					
<b>7. LTE</b>	A. Tail Rotor authority in the Mountains					
	B. Cross wind operations					
<b>8. Mountain Longline</b>	A. Line length					
	B. Approach and Departures					
	C. Load positioning					
<b>9. General Assessment</b>						
<b>10. Other</b>						

Both Pilots must sign this document

**Training Pilot Signature**

**Trainee Signature**