Rotor vs Rock
A Main Rotor Strike During a Live Slinging Operation
Presentation Goals

- Share the story & the outcomes
- Work with peers to find solutions to operational limitations
- An opportunity for other agencies to be “ahead of the learning curve”
Public Safety Specialists

- Work within Kananaskis Country, Alberta, Canada
- 10-12 calls annually involving close proximity flying
  - Pilots have more exposure to these calls
- PS Specialists are certified, professional guides who have additional training in:
  - High angle rope rescue
  - Helicopter use for mountain rescue
    - Including Class D or “Human External Cargo”
    - Technical slinging capabilities
Helicopters & Rescue Pilots

Alpine Helicopters Inc. provides all rescue flights for Kananaskis Public Safety & Parks Canada.

Alpine Helicopters Provides:

• 6 Rescue Pilots between Canmore, Alberta and Golden, British Columbia
• A single engine Bell 407 helicopter for Day VFR missions utilizing the Boost Rescue System
• Aircraft is on standby 365 days a year from Canmore base
• Annual re-current training & check flights
• Since January 1st, 2017 Alpine has responded to 221 calls, 121 of which were HEC/Class D
Helicopters & Rescue Pilots

- Alpine Rescue Pilots are certified by Parks Canada
- The 6 Pilots average
  - 9,825 hours total time
  - 7,480 hours mountain
  - 2,850 hours longline
- Parks Canada flight test requirements;
  - 2,500 hours total time
  - 1,000 hours mountain
  - 500 hours longline
- Parks Canada’s 5-7 hour flight test contains 4 phases
  - Vertical reference / barrel test
  - Mountain flying
  - Advanced and high altitude mountain flying
  - Simulated HEC/Class D live load flying
- Since the inception of the Parks Canada rescue program in 1972 there had not been a HEC/Class D accident within either agency
Experience with close proximity flying

Public Safety staff
• 5-7 rescues annually where rotor clearance is a consideration in technical terrain
• Avalanche control work-
  • Class D is NOT involved, however many start zones are near cliffs

Pilots
• Significantly higher due to working with Parks Canada, the heli ski industry & industrial work
Mount Yamnuska

- Over 150 technical rock climbing routes on the face
- Routes are long and technically challenging
- Most routes tend to be vertical to overhanging with a “wandering” nature
- The rock quality is poor!!
- Often a windy area due to its Eastern slope location
The Call

- A party of 2, mid way up Direttissima, 5.8(5B), 325m, 9 pitches
- One of the climbers was hit by a large rock
- Neck injuries are the main concern
The Initial Response

- A Bell 407 launches from the town of Canmore, an 8 minute flight
- 3 Public Safety Specialists on board, plus the pilot
- Extensively trained Conservation Officers arrive to support
- All crew members agreed a direct sling was appropriate for this situation
The Incident

- 200ft (61m) rope was used
- Pilot flew direct with live load
- Rescuer was within inches of the ledge
- Staff described hearing a “gun shot” or “thunder”
- Conservation Officer on top declared a rotor strike over the radio
- The pilot declared an emergency landing
- The landing flight took 1.5 minutes
Approximate area of rotor strike

Intended spot for rescuer

Climbers location

Base of route

265m
The Secondary Response

- Pilot and rescuer voluntarily removed from operations
- A second rescue team was brought in to climb to the subjects
  - Additional Kananaskis Public Safety
  - 2 members of Parks Canada Visitor Safety
- A second helicopter and rescue pilot was brought in to finish the rescue
- The subject was lowered using an organized rope rescue and another heli-sling
Aircraft Damage

- Extensive maintenance required to repair, overhaul or replace the following
  - Turbine-Compressor-Engine Gearbox-Drive Shaft-Free Wheel-Transmission-Mast-Main Rotor Head-Blades
  - Cost was significant
- Aircraft was disassembled and trailered back to hangar before rescue was completed
- Aircraft returned to service 11 days later
Post Incident Investigations

- Transport Canada
  - National Transportation Safety Board (NTSB)

- Alpine Helicopters internal investigation
  - Began immediately after the accident by local managers and Chief pilot
  - Rescue Pilot placed on temporary hiatus from rescue program pending ongoing evaluation

- Alberta Government commissioned an independent report to identify deficiencies within the program and offer recommendations
Lessons Learned

Alpine
• A trial run using an empty line to check for rotor clearance and hazards should be performed prior to insertion of rescuer
• Removal of the door & basket to increase visibility for pilot
• More training
  • With 200ft and longer longlines
  • In vertical terrain
  • With extendable poles for reaching accident scenes with limited clearance
  • For emergency landing situations

Rescuer/Agency
• KCPS self implemented:
  • Documentation of decision making
  • More frequent & enhanced Class D training
  • Internal procedures for dealing with the outcome of incidents
  • Possible placement of permanent anchors and safe rescuer insertion points

• An independent report recommended:
  • A modification of staff training that would see more climbing time
  • Staffing levels that maintain adequate coverage after an involved rescue
  • A documented risk assessment for each rescue
Thank You for listening

Questions or comments?