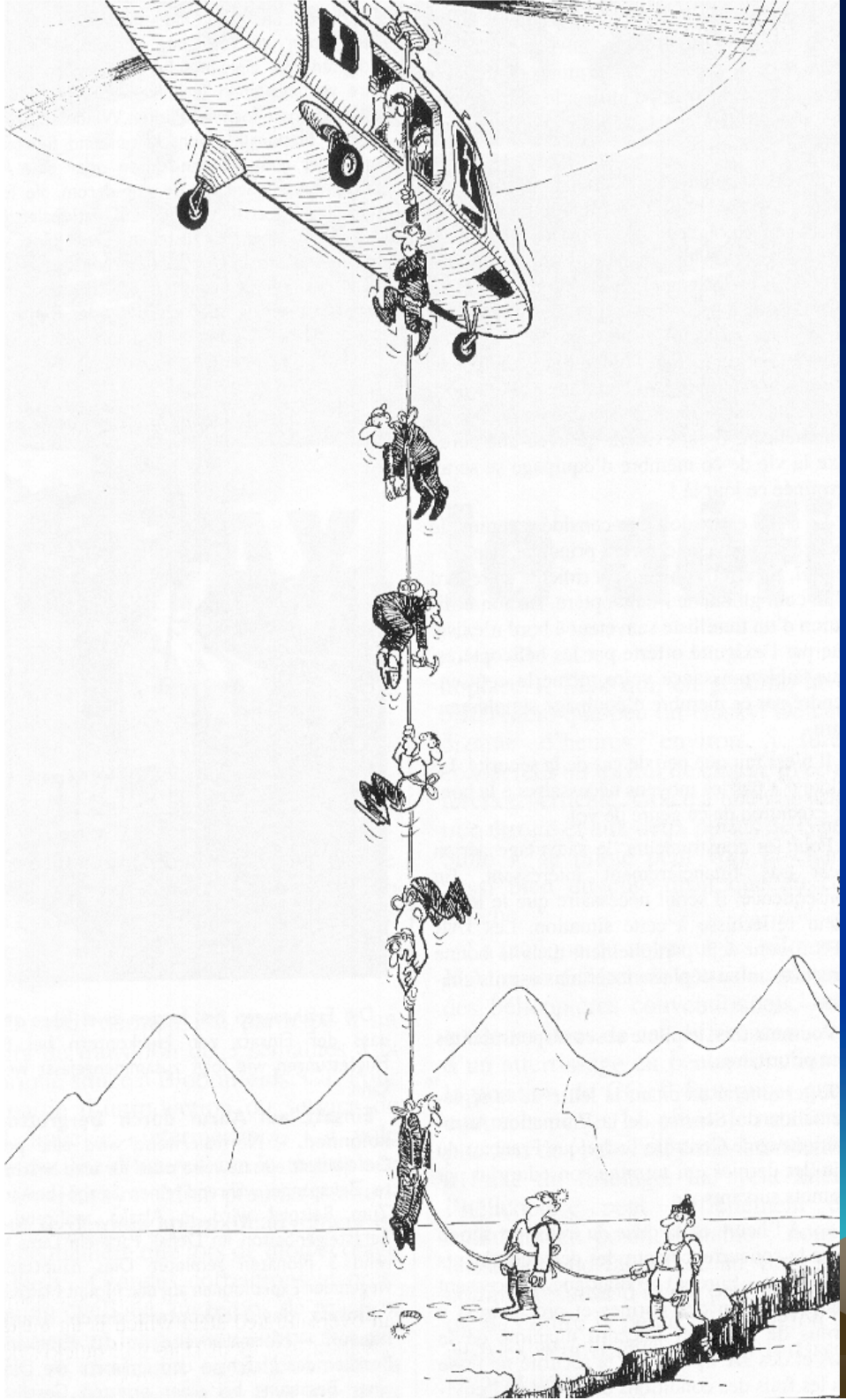
VERY LONG LINE

IKAR 2006 Kranska Gora

Presented by

Gerold Biner and Pat. Fauchère

- Definition
- Swiss model
- Nice to see but hard to do
- Training
- Frequency
- Decision criteria
- Why we use it
- Sop’s and communication



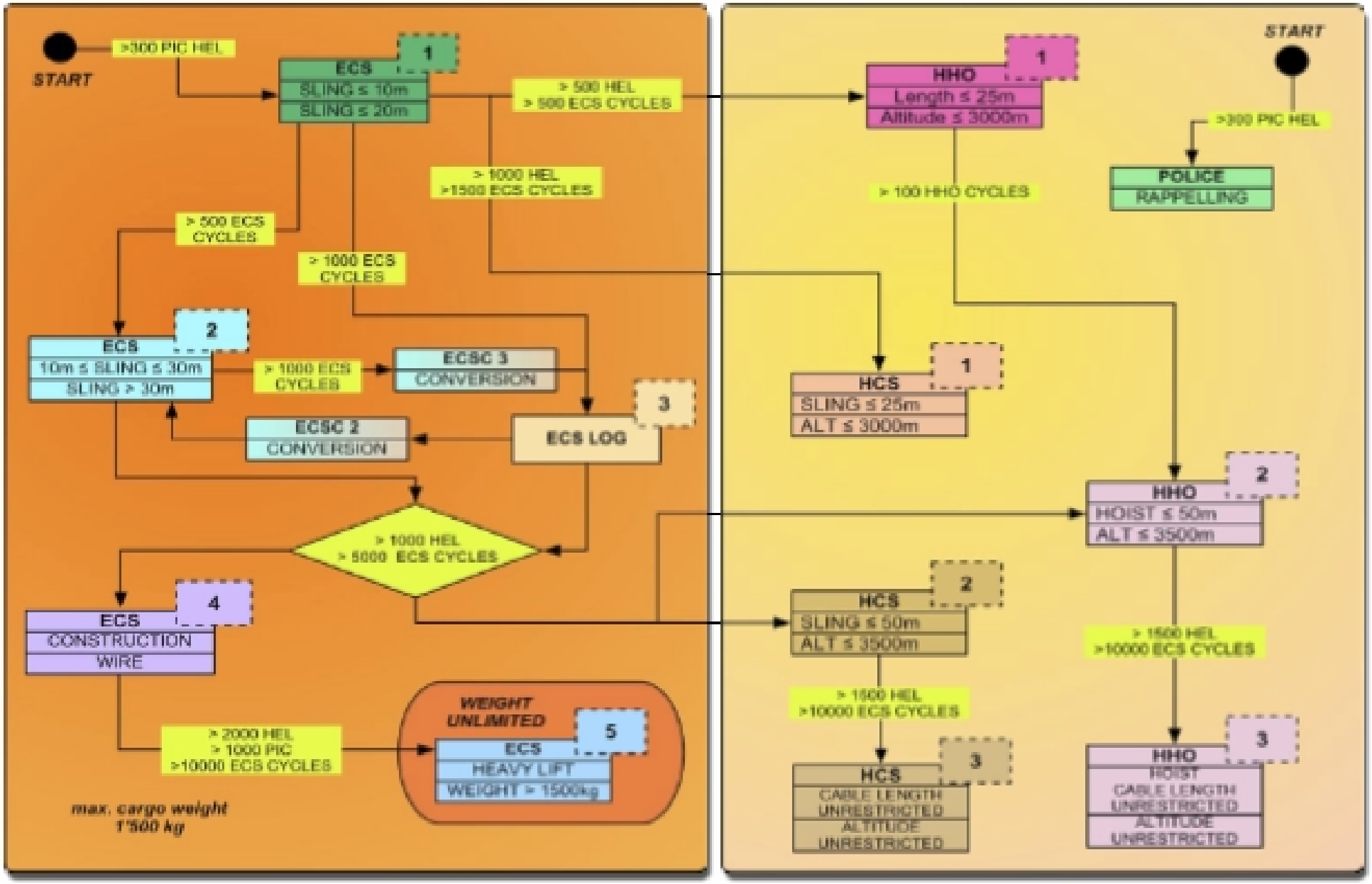
The standard in the Very Long Line mountain rescue in Switzerland is based on the know how of the commercial Pilot’s

Definition FOCA Switzerland

- Line L is from 0 to 20 m
- Long Line LL is from 20 to ……

Bundesamt für Zivilluftfahrt (BAZL)
Office fédéral de l'aviation civile (OFAC)
Ufficio federale dell'aviazione civile (UFAC)
Federal Office for Civil Aviation (FOCA)

HELICOPTER EXTERNAL LOAD
crew requirements for Swiss operations



14.4.2005 / SBHE - Helicopter Operation, Maulbeerstrasse 9, CH-3003 Bern, Schweiz, Telefon +41 31 325 80 39, Telefax +41 31 325 80 32, www.aviation.admin.ch

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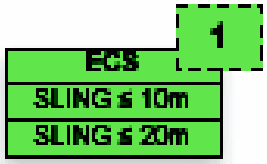


External Cargo Sling level 1
Dead weight attached to the helicopter cargo hook. The sling length and weight are limited

External Cargo Sling level 2
Dead weight attached to the helicopter cargo hook. The sling length is unlimited after completion of level 2. Heli logging ops are not included

External Cargo Sling level 3
Dead weight attached to the helicopter cargo hook. Heli logging with unlimited sling length. Normal Long line work is excluded

External Cargo Sling level 4
Construction and assembly work as well as wire stringing. Operations performed on ground or on towers, cranes and poles

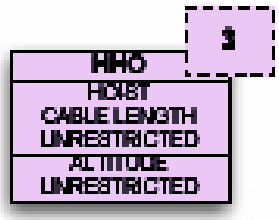
External Cargo Sling level 5
Loads in excess of 1'500 kg. The sling length is unlimited construction work is included as well as logging if ECS 3 is completed

External Cargo Sling
Conversion from level 3 to level 2
Conversion for Experienced Heli logging pilots to other long line operations

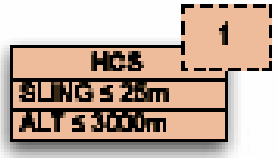
External Cargo Sling
Conversion from level 2 to level 3
Conversion for Experienced Long line pilots to Heli logging operations

Helicopter Hoist operations level 1
Live weight attached to the helicopter winch cable. Cable length and altitude of operation are limited. Hoist cable must be fully retractable

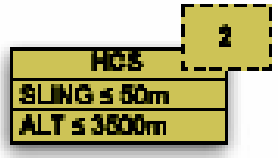
Helicopter Hoist operations level 2
Live weight attached to the helicopter winch cable. Cable length and altitude of operation are limited. Hoist cable must be fully retractable



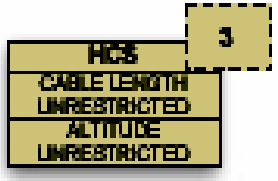
Helicopter Hoist operations level 3
Live weight attached to the helicopter winch cable. Cable length and altitude of operation are unlimited. Hoist cable must be fully retractable



Human Cargo Sling level 1
Live weight attached to the helicopter cargo hook. Cable length and altitude of operation are limited. Hoist cables extensions below the normal winch hook are considered as HCS



Human Cargo Sling level 2
Live weight attached to the helicopter cargo hook. Cable length and altitude of operation are limited. Hoist cables extensions below the normal winch hook are considered as HCS



Human Cargo Sling level 3
Live weight attached to the helicopter cargo hook. Cable length and altitude of operation are unlimited. Hoist cables extensions below the normal winch hook are considered as HCS

Helicopter Rappelling
Police and squat team operations with fixed ropes.

1

HCS

SLING ≤ 25m

ALT ≤ 3000m

Human Cargo Sling level 1
Live weight attached to the helicopter cargo hook. Cable length and altitude of operation are limited. Hoist cables extensions below the normal winch hook are considered as HCS

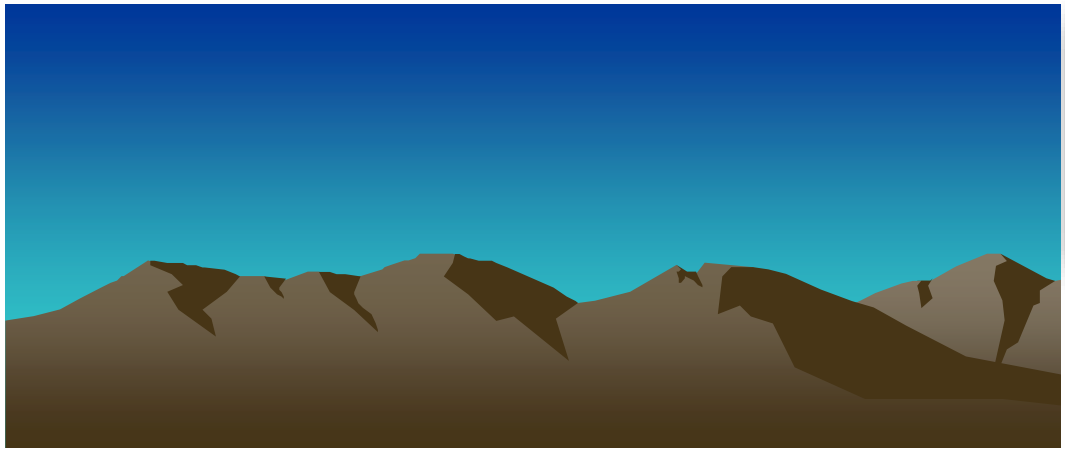
2

HCS

SLING ≤ 50m

ALT ≤ 3500m

Human Cargo Sling level 2
Live weight attached to the helicopter cargo hook. Cable length and altitude of operation are limited. Hoist cables extensions below the normal winch hook are considered as HCS



3

HCS

CABLE LENGTH UNRESTRICTED

ALTITUDE UNRESTRICTED

Human Cargo Sling level 3
Live weight attached to the helicopter cargo hook. Cable length and altitude of operation are unlimited. Hoist cables extensions below the normal winch hook are considered as HCS

HUMAN CARGO SLING INSTRUCTION

FOM

- Flight and duty times
- Max. cycles / day
- Min. and max. fuel
- Refueling procedures
- Radio communications
- Human factors / CRM / nutrition
- Safety equipment / operational briefing
- Pilot / HCS crew member responsibilities

Flight Manual

- Limitations
- Performance / HOGE
- Cargo Hook supplement

Flight Procedures

- Airspeed selection with load
- Flight path selection (3rd party)
- Bank / load factor / load drag
- Load stabilisation techniques / hover & in-flight
- Downwash / load rotation
- Visual hover reference / vert, horiz
- Rotor clearance.
- Hand signals
- Environement / slope / forest, canyon
- Night operations / lights / NVG / Nightsun
- *Off Ground operations (crane, chair lift, etc)*
- Decision / exposure time

Load & Person Preparation

- Vertical loads
- Horizontal loads
- Multiple person extraction

Special Equipment

- Rescue Harness.

Special equipment used by company:

1.
2.
3.
4.
5.
6.

Emergency / Limitations

- Flight control stops
- TR failure
- Engine failure / OEI operation.
- Height velocity diagram / exposure time
- HEC emergencies / malfunctions
- Review of HCS accidents
- Emergency load jettison

Dangers

- Windshield defogging / demisting
- Low temperature operation / Chill factor
- Cables / wires
- Airflow / up and downdrafts / Settling with power / vortex
- Sun / shadow / snow / rain / static
- Light / Twilight / Night ops
- Cliffs / falling rocks

Remarks:

Minimum requirements before starting practical HCS 1 instruction:

- **CPL(H) / ATPL(H)**
- **Min 1'000h HEL / 1'500 ECS cycl.**
- **ECS Level 1 completed TO 20m**
- **Type rating completed**
- **Min. 10h PIC on type of HEL**
- **HCS Ground instruction reviewed**

I herewith certify that the trainee has received the required HCS ground instruction and is found competent to begin the practical HCS 1 instruction.

Date: .....

Name: .....

Signature: .....

FOCA/OFAC/BAZL, HELI-OPS, Maulbeerstrasse 9, CH-3003 Bern

DAY HCS

Flight instruction DC / min. 10 HCS cycles which of 5 cycles "Human cargo": (every square is 1 cycle /use codes)

Cycle N°	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ops. equipement:															
Emerg.Procedures:															

WARNING: NO Human cargo during emerg. proc. tng. Use Human cargo only in conjunction with task specialist training.

Trainee may perform solo HCS1 with on site supervision

Date: .....Signature / License N°:.....

Flight instruction with on site supervision / min. 5 HCS cycles: (every square is 1 cycle /use codes)

Cycle N°	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ops. equipement:															

Trainee is found properly qualified for Daylight Human Cargo Sling Operations (HCS1) without supervision
The trainee's log book has been endorsed for "HCS level 1"

Date: .....Signature / License N°:.....

NIGHT HCS (optional)

NOTE:
FOCA does not provide an approved training program for NIGHT HELICOPTER HUMAN CARGO SLING OPERATIONS.

These operations are highly hazardous and require above average piloting skills and crew communication as well as perfect planning by an operator. Nerver the less such operations may be described in the Flight operations manual of a particular helicopter company. If such opeations are conducted, the following statement must be entered in the trainee's logbook and signed by the chiefpilot.

The trainee has received adequate instruction in night helicopter Human Cargo Sling operations and is found competent to perform HCS level 1 at night.

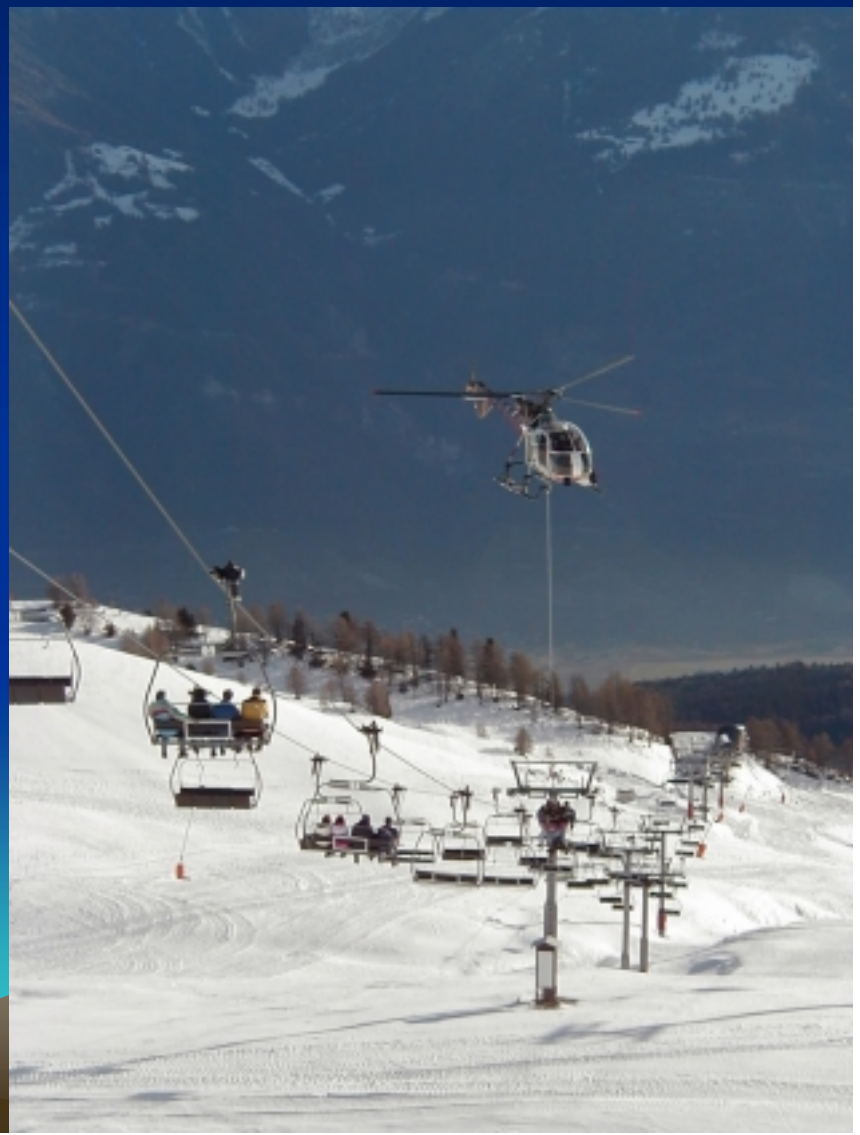
Total Helicopter Flight experience:

☐ 1'000h<HEL<3'000h ☐ 3'000h<HEL<5'000h ☐ HEL>5'000h

TOTAL TIME HCS1: ..... N° of cycles HCS1: .....

Remarks:

To be able to perform this we need first to go through ECS 1



Training

- Basic training is provided as per the ECS, HEC, HHO syllabus document
- ECS 1 = min 5 hours instruction then another 10 hours under supervision
- ECS 2 and 3 = min 3 hours instruction then another 10 hours under supervision
- HCS 1,2,3 = min 1 hour instruction then another hour under supervision
- HHO 1,2,3 = min 2 hours instruction then another hour under supervision

Minimum requirement

Minimum requirements before starting practical HCS 1 instruction:

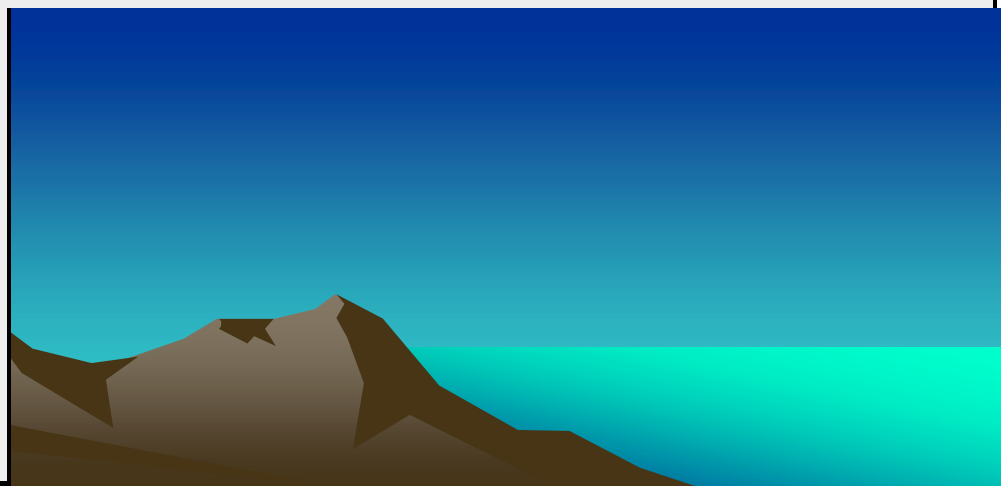
- CPL(H) / ATPL(H) ☐
- Min 1'000h HEL / 1'500 ECS cycl. ☐
- ECS Level 1 completed TO 20m ☐
- Type rating completed ☐
- Min. 10h PIC on type of HEL ☐
- HCS Ground instruction reviewed ☐

Minimum requirements before starting practical HCS 2 instruction:

- CPL(H) / ATPL(H) ☐
- Min 1'000h HEL / 5'000 ECS cycl. ☐
- ECS Level 2 or 3 completed ☐
- Type rating completed ☐
- Min. 10h PIC on type of HEL ☐
- HCS Ground instruction reviewed ☐

Minimum requirements before starting practical HCS 3 instruction:

- CPL(H) / ATPL(H) ☐
- Min 1'500h HEL / 10'000 ECS cycl. ☐
- HCS Level 2 completed ☐
- Type rating completed ☐
- Min. 10h PIC on type of HEL ☐
- HCS Ground instruction reviewed ☐



Nice to see
but
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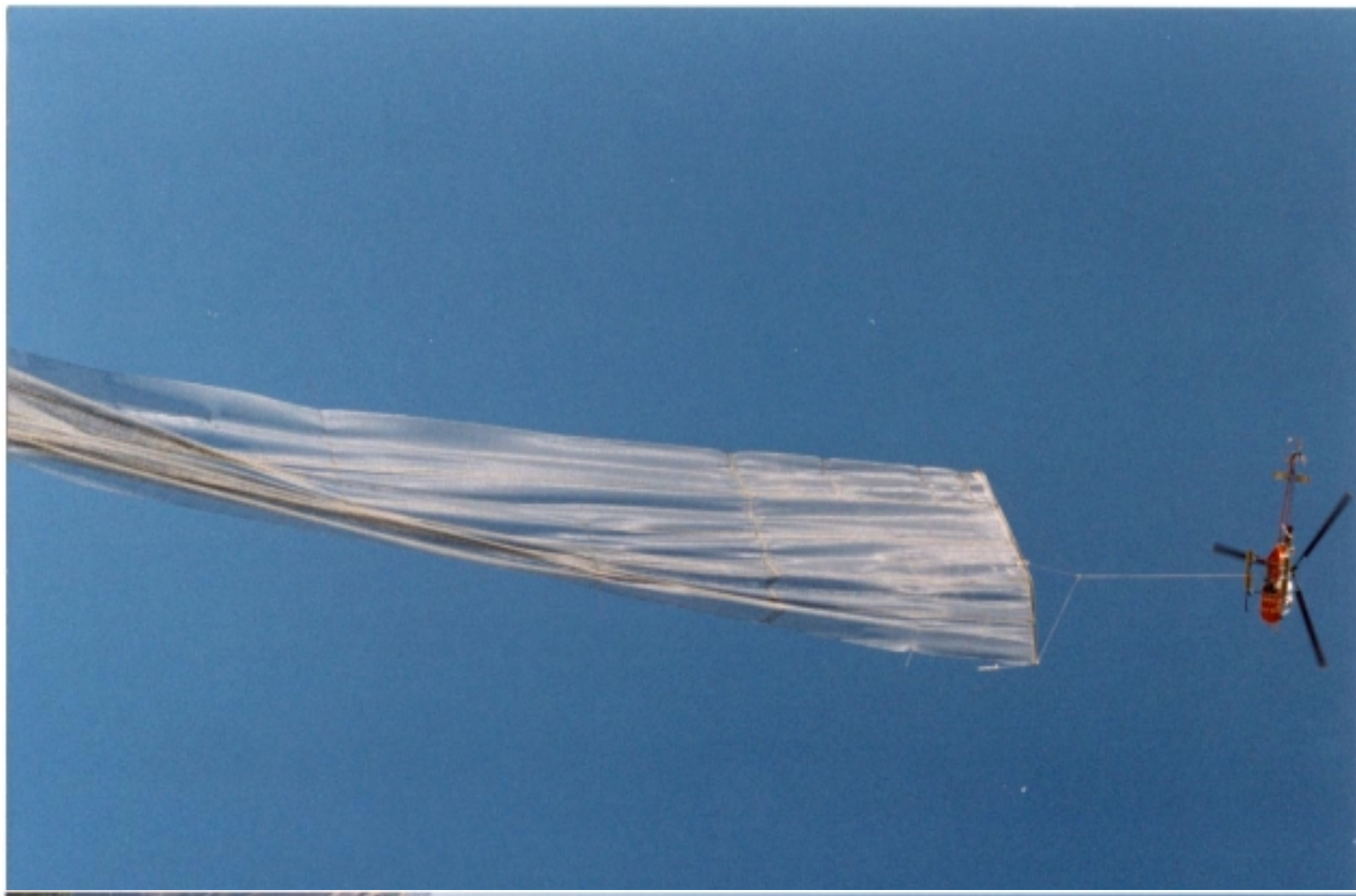
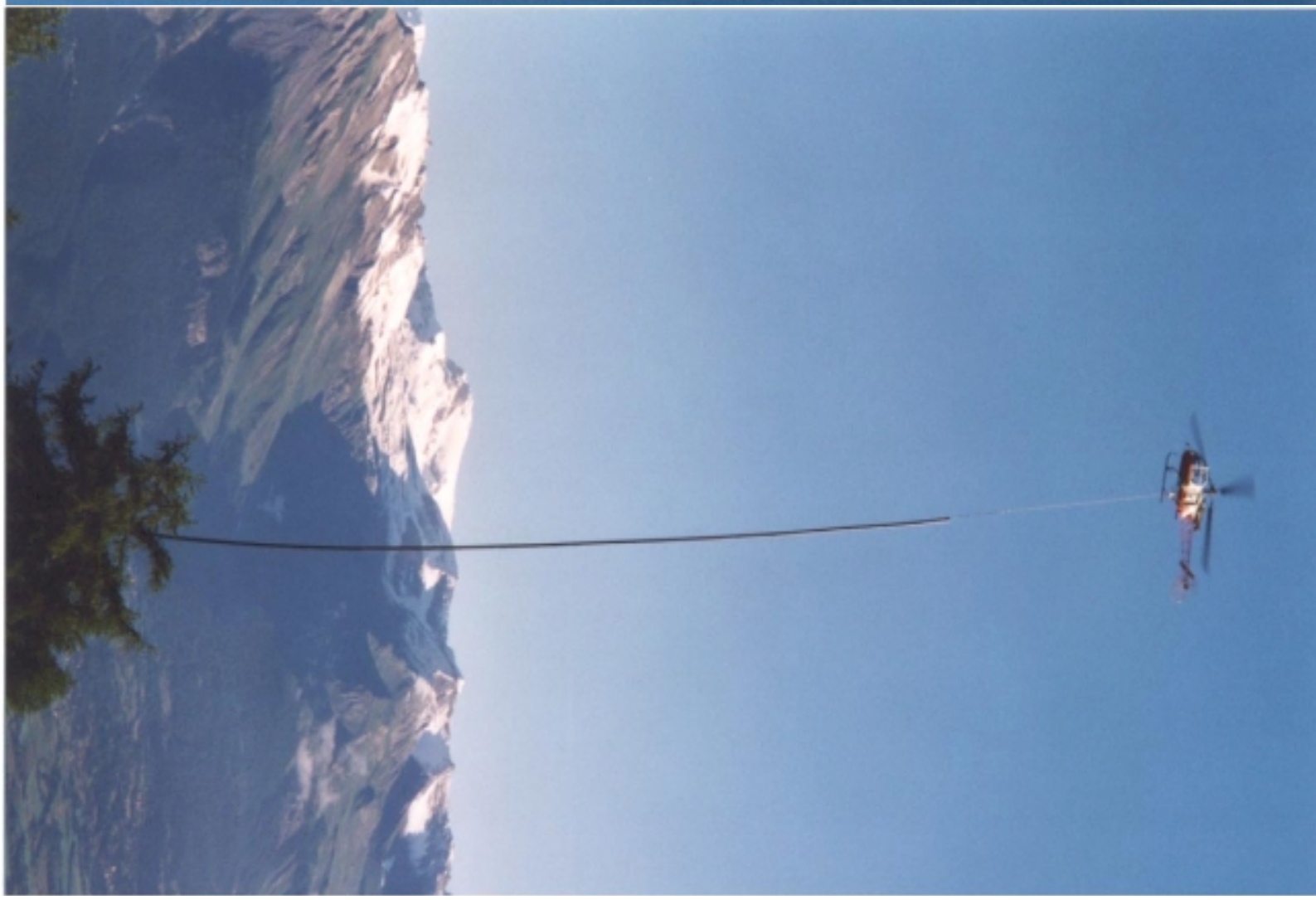




Maximum lengths used in normal conditions and frequency / HHO

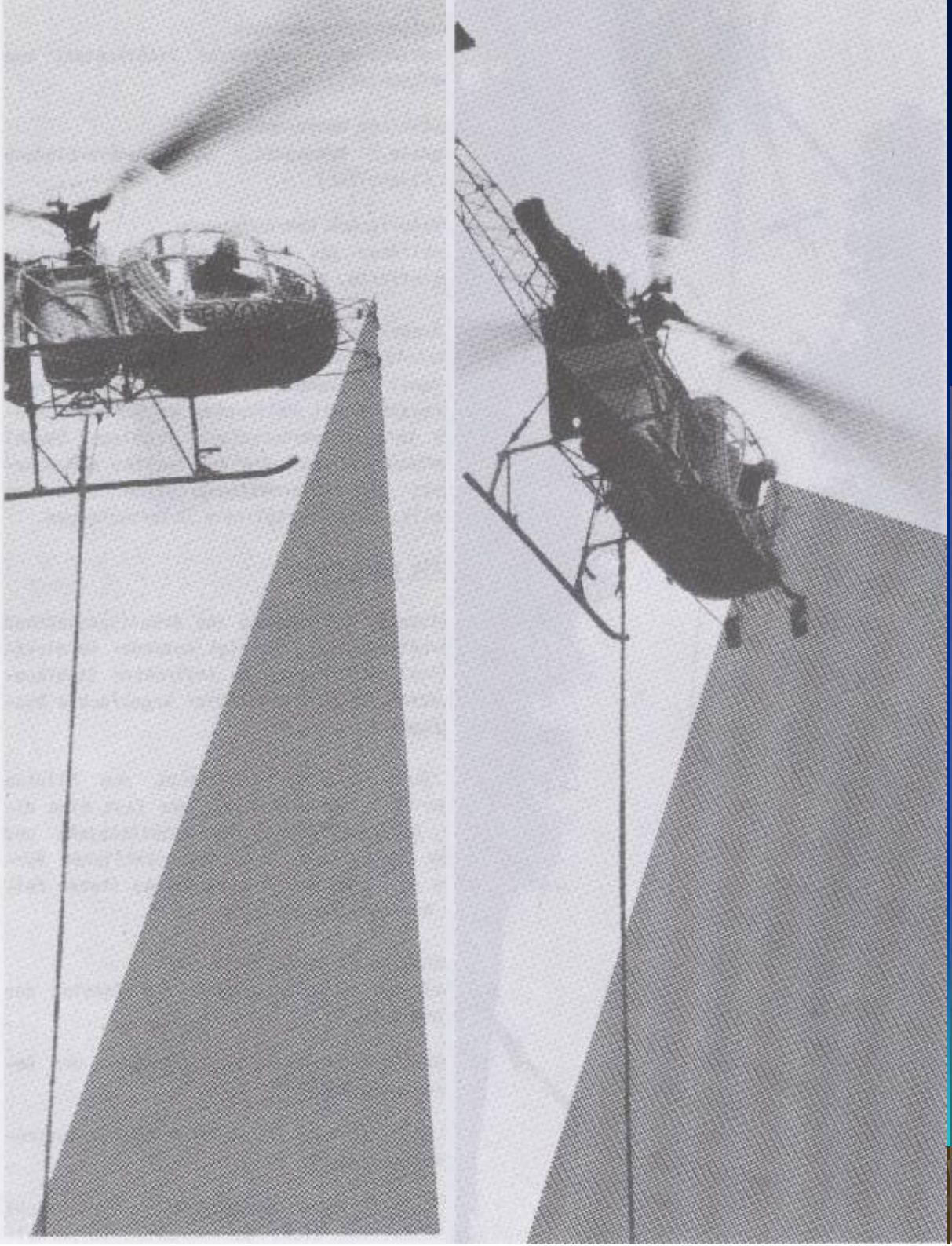
- Alouette 3 = 25 meters hoist cable with extensions of 5 and 10 meters
- Total of 40 meters on the hoist / used 7 – 10 time year
- Ecureuil B3 = 50 meters hoist cable without extensions
- Use of 50 meters lengths around 10 time a year

Maximum lengths used in normal conditions and frequency / HEC

- All helicopters 10 meters up to 50 meters is standard and is used regularly
- 80 meters is used 7 - 10 time a year with all 3 machine with priority to be given to lama then B3 then Al3
- 80 to 120 meters is used 7 - 10 time a year with the B3 and the Lama
- 120 m to 240 m is used 2 - 5 time a year with the Lama

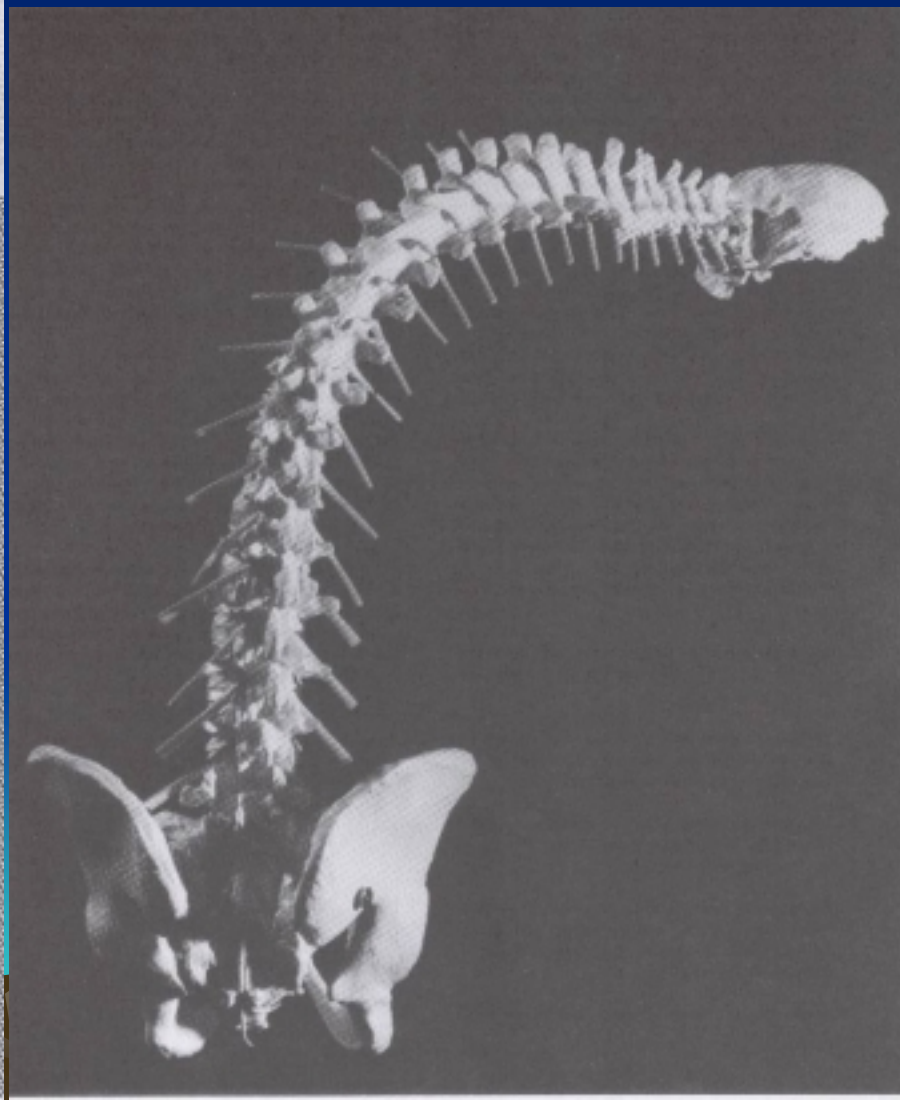
Decision criteria / cargo vs hoist

- Better C and G configuration
- Greater payload
- Better visibility due to vertical reference
- Better power margin with the use of B3 and Lama
- Pilot’s used to vert ref on daily work



- Mirror vs vertical reference

- Pilotus Deformatus

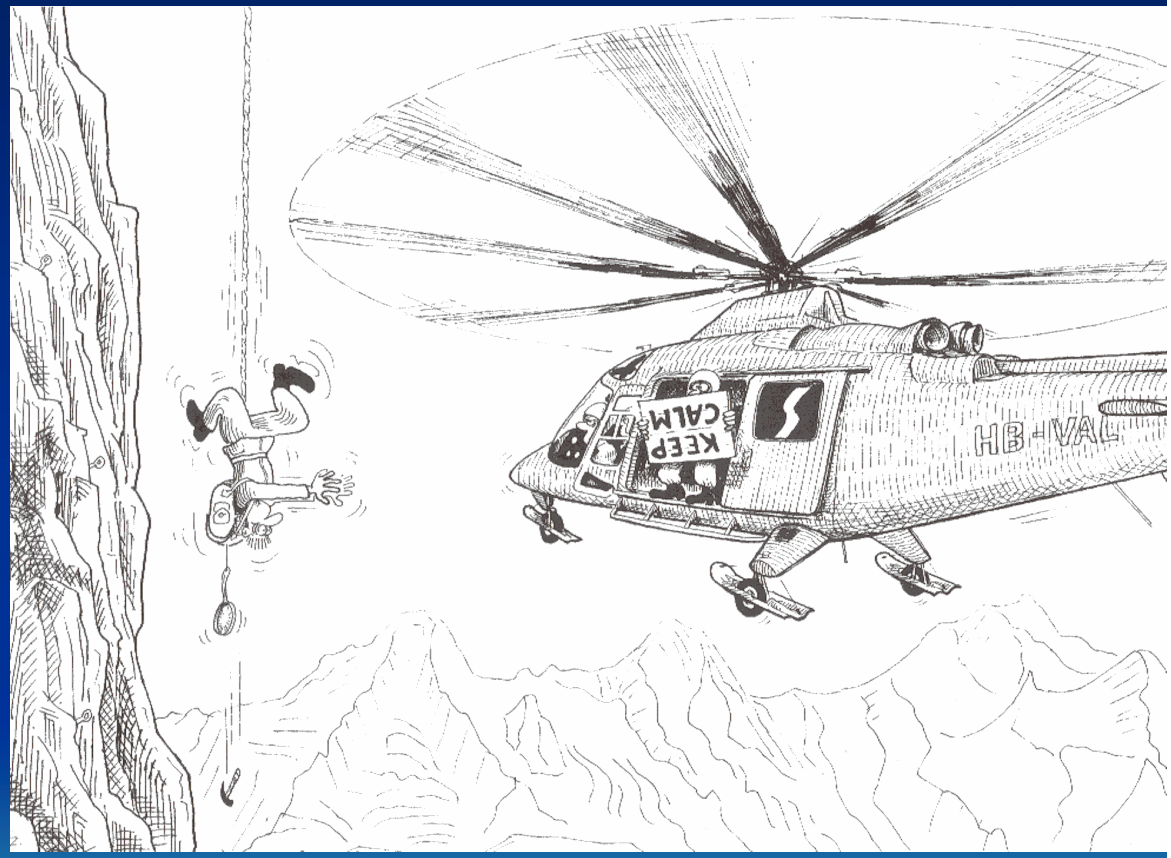


Why do we need the Very long line

- To avoid downwash / scary situations for the patient, delta, paraglider, basejumper,balloon, rocks falling,etc,,,
- To avoid rock falls in the cliffs and faces (blade or helicopter strike)
- To get to the patient in deep and narrow canyons – river beds (canyoning, delta,basejumper,paraglider)
- To avoid downwash when operating in congested areas like (city, top of a building, etc…)
- For multiple evacuation 3 to 5 persons
- When under a time limit due to weather condition, night…

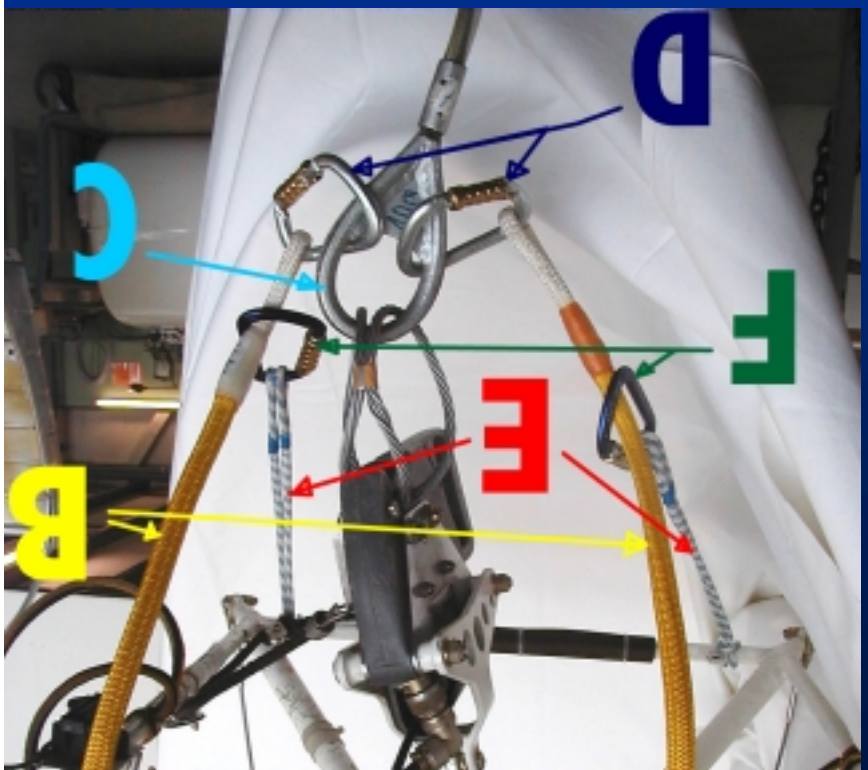
SOP’s and communication

- Two way communication tested before the mission (guide, rescuer, doctor,pilot…)
- Sop’s is provided for hoist and for HEC both approved by FOCA and are very similar to AZ-Rega



What we use

- 10mm Steel cables from 10 meters up to 80 meters equipped with security hooks
- Static ropes
- 16 mm (100 kn) Cabin security ropes for Alouette, Lama and Ecureuil B3 (max 600 kg)
- Double hook system


D
C
F
E
B

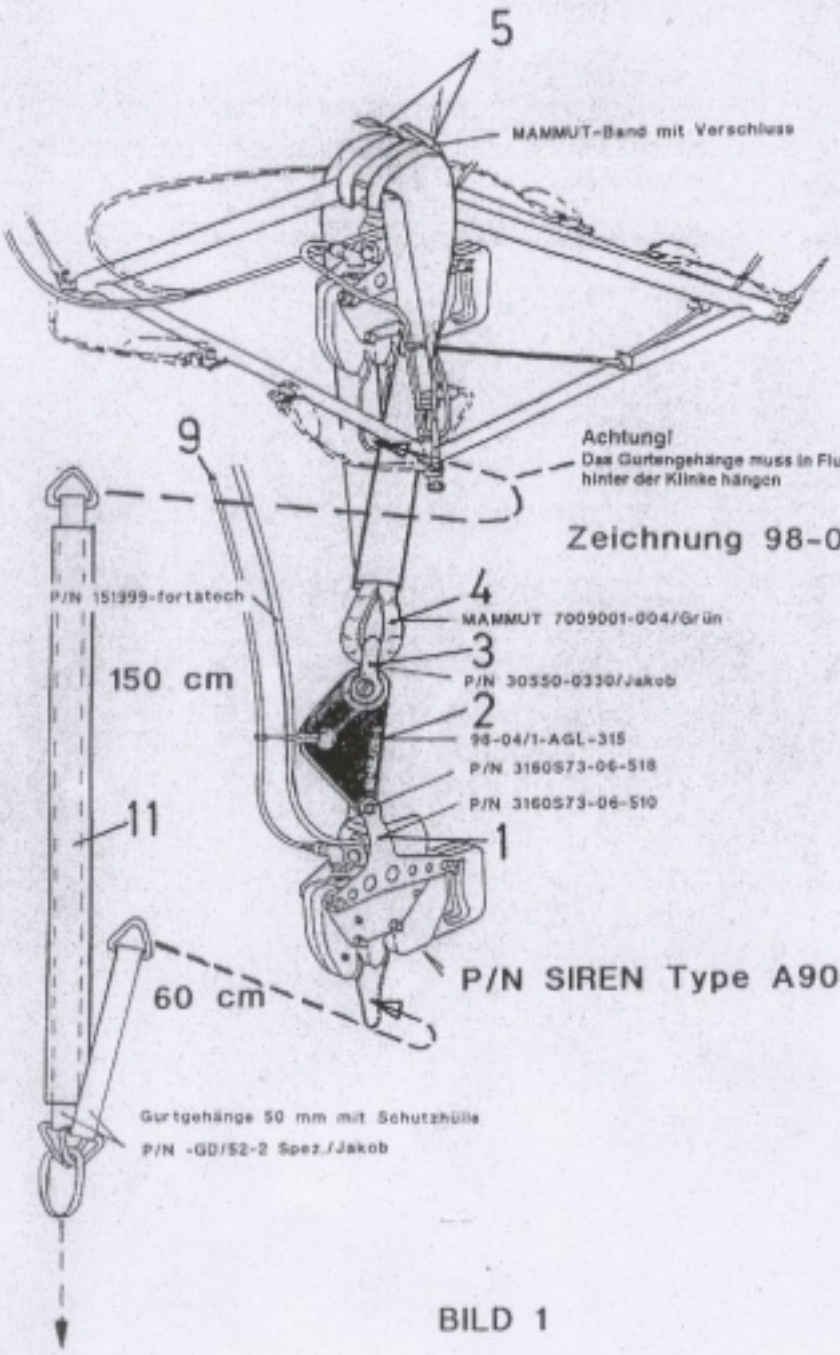
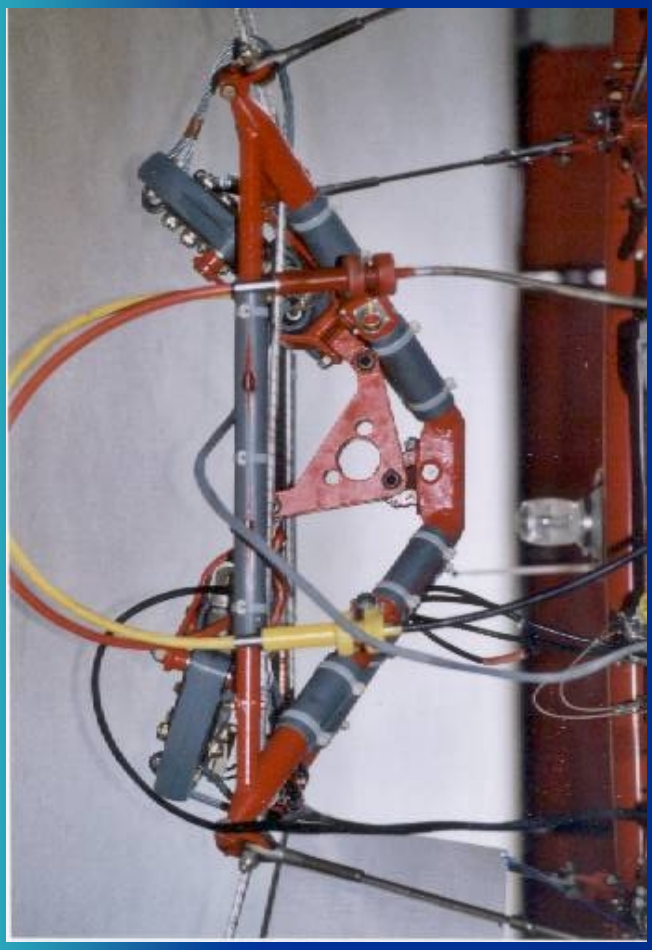

5
MAMMUT-Band mit Verschluss
9
Achtung!
Das Gurtengehänge muss in Flugrichtung hinter der Klinke hängen
Zeichnung 98-04
P/N 151399-fortatech
4
MAMMUT 7009001-004/Grün
3
P/N 30550-0330/Jakob
150 cm
2
98-04/1-AGL-315
P/N 3160S73-06-518
P/N 3160S73-06-510
11
1
P/N SIREN Type A90A
60 cm
Gurtgehänge 50 mm mit Schutzhülle
P/N -GD/52-2 Spez./Jakob
Rettungsgerät

BILD 1



When we use / Risk analysis

- We use it for insertion and extraction

- Exposure time as short as possible
- Flight with rescuers as short as possible

Thank you

Questions ?????