




Mountain Rescue – Swiss Rescue Skills brought to the Himalaya

Gerold Biner, Monika Brodmann,
Bruno Jelic





From Matterhorn to Mount Everest

- The beginning
- Challenges for pilots and rescuers:
 - Altitude
 - Technical rescues
 - Medical aspects
- Evolution of the project:
 - Local rescue chain: PLNN Hospital Lukla
 - LUHMA
- Perspectives



The Beginning

Nanga Parbat, Pakistan, 6. Aug. 2005



The Beginning



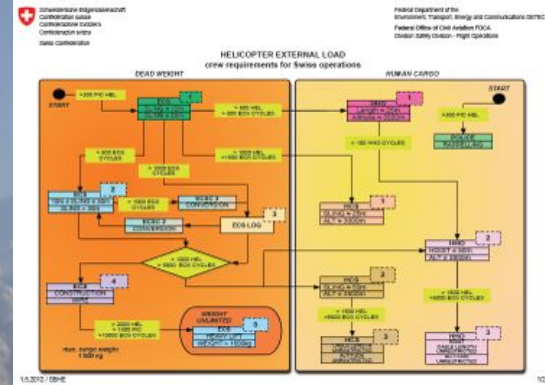


Challenges for Pilots and Rescuers

- Altitude
- Oxygen
- Mountain Flying Skills
- Human Cargo Sling
- Swiss Regulation



Challenges for Pilots and Rescuers



Challenges for Pilots and Rescuers

ECS 1 Application Form

EXTERNAL CARGO SLING GROUND INSTRUCTION

Pilot in charge of theoretical instruction (must have a minimum of 500h ECS experience)

Last name: _____ First name: _____ License N°: _____

FOM	Special Equipment
Flight and duty times	Concrete bucket / Water bucket
Max. cycles / day	Load lifting attachments (line, net, bag, BCI, FBC)
Min. and max. fuel	Slinging equipment (round sling, chain, shackles, etc.)
Evacuation procedures	Load lifting means (cargo hook, remote hook, etc.)
Radio communications	Load meter / printer
Human factors / CRM / nutrition	Mirror
Safety equipment / operational briefing	Stable window / vertical reference
Pilot / manhandle responsibilities	Audio / vibration warning
Flight Manual	Emergency / Limitations
Limitations	Flight control steps
Performance / MOCSE	TR failure
Cargo hook supplement	Engine failure / OEI operation
Flight Procedures	Height safety / obstacle clearance



Challenges for Pilots and Rescuers

ECS 1 FLIGHT INSTRUCTION

LEVEL 1 SHORT LINE
Sling length: ≤20 meters

Conditions:

- Maximum sling length: 20 meters
- Maximum cargo weight: 1500 kg
- 1 manhandle (with rotor) at drop-off point
- 1 manhandle (with rotor) at drop-off point
- Helicopter flies with cargo rotor / fuselage window
- If applicable

VERTICAL REFERENCES: The rescue must be able to perform a stabilized hover flight by means of vertical reference without any external cargo attached to the helicopter prior to commencing training with external loads.

DEFINITIONS: Mission: One mission is an ECS flight or series of ECS flights, conducted from site A to site B, for a particular customer, on a particular day. Cycle: A cycle is a flight from site A to site B with an external load and subsequent return to site A.

Pilot (preferably Flight Instructor) in charge of ECS practical training (must be qualified at minimum for ECS level 1 and 2 and must have a minimum experience of 500 hours ECS | Maximum 2 persons)

Last name: _____ First name: _____ License N°: _____

Last name: _____ First name: _____ License N°: _____

Flight instruction DC: minimum 5 hours (every square is 1 hour) Vertical ref

Slinging 5 Cycles

1	2	3	4	5
---	---	---	---	---

Cycles DC: minimum 50 cycles (every square is 1 cycle) (squares include load types 1 through 5)

Trainer may perform solo ECS1 limited to 10m sling length with on site supervision

Date: _____ Signature: _____ License N°: _____

Cycles DC: minimum 30 cycles (10m sling + 20m) (every square is 1 cycle) (squares include load types 1 through 5)



Material

- Helicopter equipped with radio
- Cabin security AIR-Work
- Oxygen masks with radio-communication NASA
- Sherpas equipped with radio helmets and radios
- MERS 15 m / 20 m
- Stripes and buoy
- 3 stretchers REGA
- 3 rescue bags REGA
- Tripod with winch
- 1 rescue backpack with mountaineering equipment KONG
- Mountaineering clothes Mammut



Rescuers' equipment



Preparing the rescue bag



Evacuation system MERS and „diaper“



Radio communication training



Oxygen masks



Signals for the helicopter



Keep quiet during landing



Installing the MERS system



Radio and flight training



Preparing the MERS system



Preparing and connecting one person



Flight training



Training with rescue bag REGA



Communication during landing with a patient in the rescue bag



Handover in difficult terrain



Crevasse rescue with tripod



Rescue scenario at Matterhorn



Transport of material



Medical Aspects



- Rescued persons are patients
- Rescuers are medical laypersons
- Selfprotection
 - Blocked in high altitude
- First do not harm
- Avoid deterioration during the flight
- Referring hospital(s)



Logbook for Rescuers **arf** alpine rescue foundation zermatt

LOGBOOK FOR ARF RESCUERS
(NAME):

Main topic	details 1	details 2	details 3	course method	date 1	place 1	date 2	place 2
Main topic Patient check	introduction	ADVICE	airway, breathing circulation, in general	1	08.12.13	Kim		
			measuring oxygen saturation	1	14.12.13	Luka		
Features	general	check circulation, sensibility, consciousness, GAG	measuring blood pressure	1	08.12.13	Kim		
			measuring blood pressure	1	14.12.13	Luka		
Altitude-related health problems	introduction	Altitude, measures and oxygen	pathophysiology in general	0.5	08.12.13	Kim		
			basic controls, oxygen mask, pocket mask for ventilation	0.5	08.12.13	Kim		
	AMS and HACE	high altitude mountain sickness and high altitude cerebral edema	signs and symptoms	1	08.12.13	Kim		
			prevention	1	08.12.13	Kim		
	HAPE	high altitude pulmonary edema	signs and symptoms	1	08.12.13	Kim		
			prevention	1	08.12.13	Kim		
	Therapy			1	08.12.13	Kim		
				1	08.12.13	Kim		

Medical Education **arf** alpine rescue foundation zermatt

Rescue Chain

Khumbu

PLNN Hospital Lukla

- Open since 2005



PLNN Hospital Lukla

- Open since 2005
- For local people



PLNN Hospital Lukla

- Open since 2005
- For local people
- Support from Switzerland
 - Finances
 - Quality control
 - Experienced physicians



PLNN Hospital Lukla

- Open since 2005
- For local people
- Support from Switzerland
 - Finances
 - Quality control
 - Experienced physicians
- Nepalese medical and administrative staff



Networking




Lukla Hospital Medical Assistance

- Basic medical aid for Nepalese living in very remote areas
 - Access only by foot or helicopter
- Medical camps with staff from Lukla Hospital
 - Transport by helicopter
- Coordination with District Health Officer




1st Medical Camp

- Bung / Solukhumbu
- 5-6th December 2013
- 2 MDs, 2 nurses, 3 „paramedics“
- 776 patients
- Main complaints:
 - Gastrointestinal problems
 - Musculoskeletal pain
 - Cataract
 - Severe problems:
 - Susp. Cholecystitis
 - Breast abscess




Perspectives