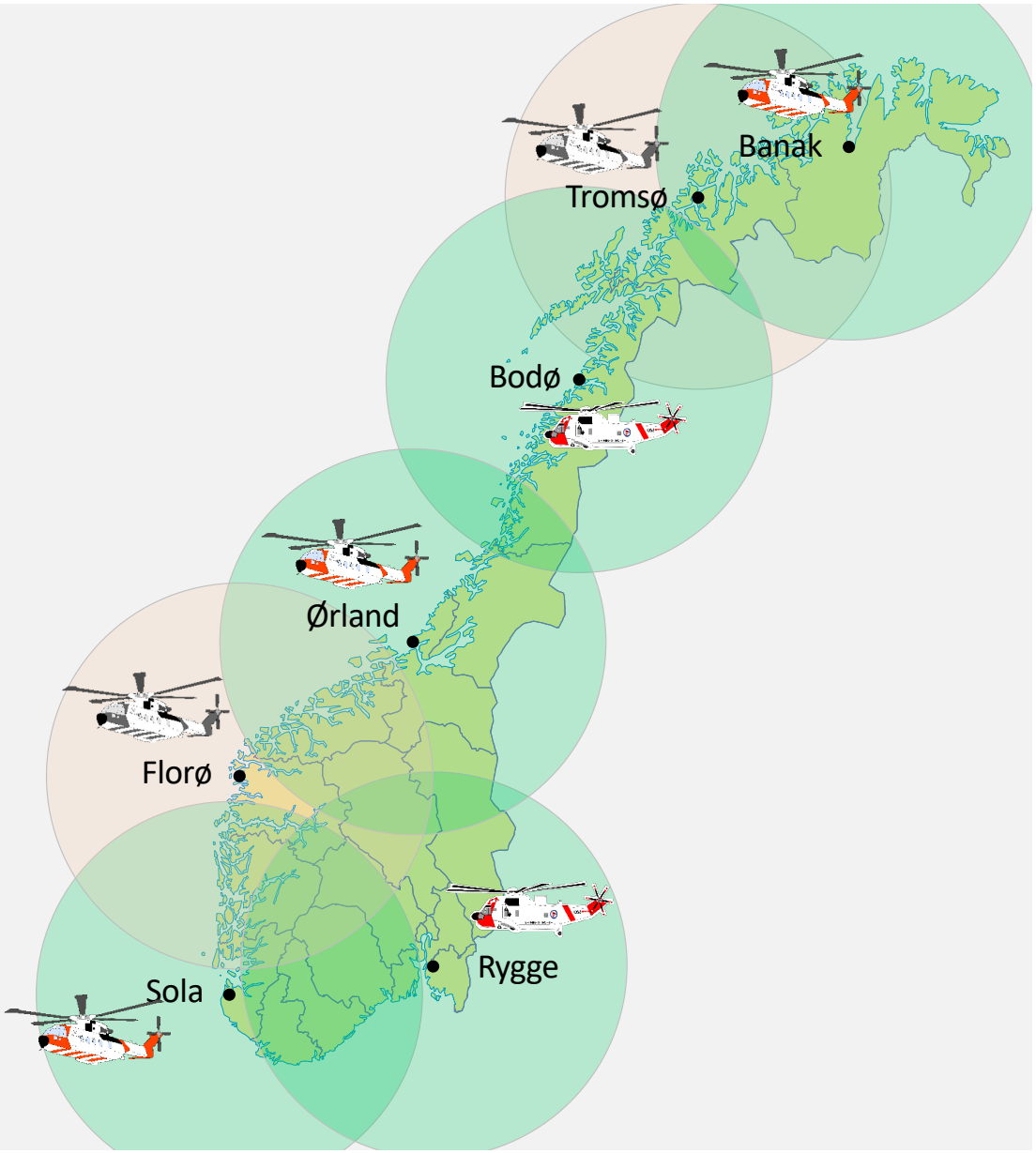
Royal Norwegian Air Force
330 Rescue Helicopter Squadron

Torgeir Kjus - Morten Sandvik

Helicopter Long Rope Rescue Techniques
ICAR Conference Montreux 2022

330 SKV

VI REDDER LIV




RESCUE


0281
AFSN
Aviation Fueling Services Norway
JET A-1

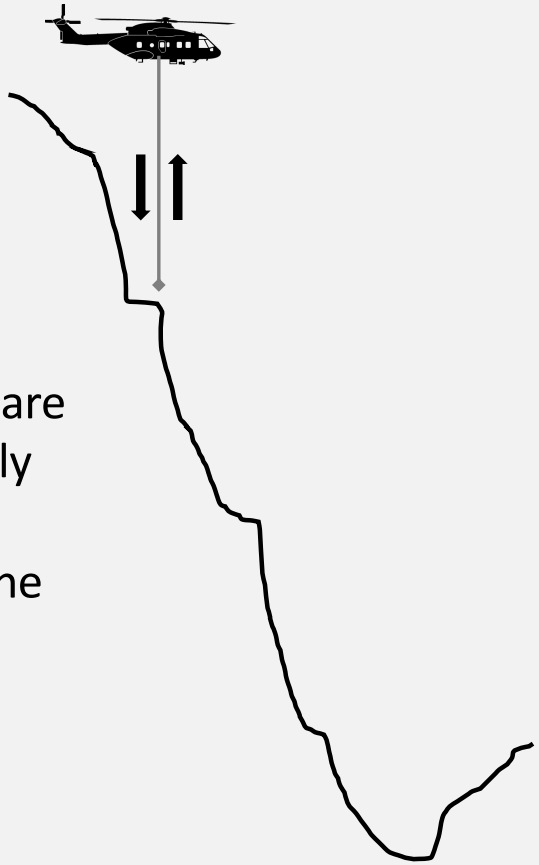
Different techniques for alpine rescue

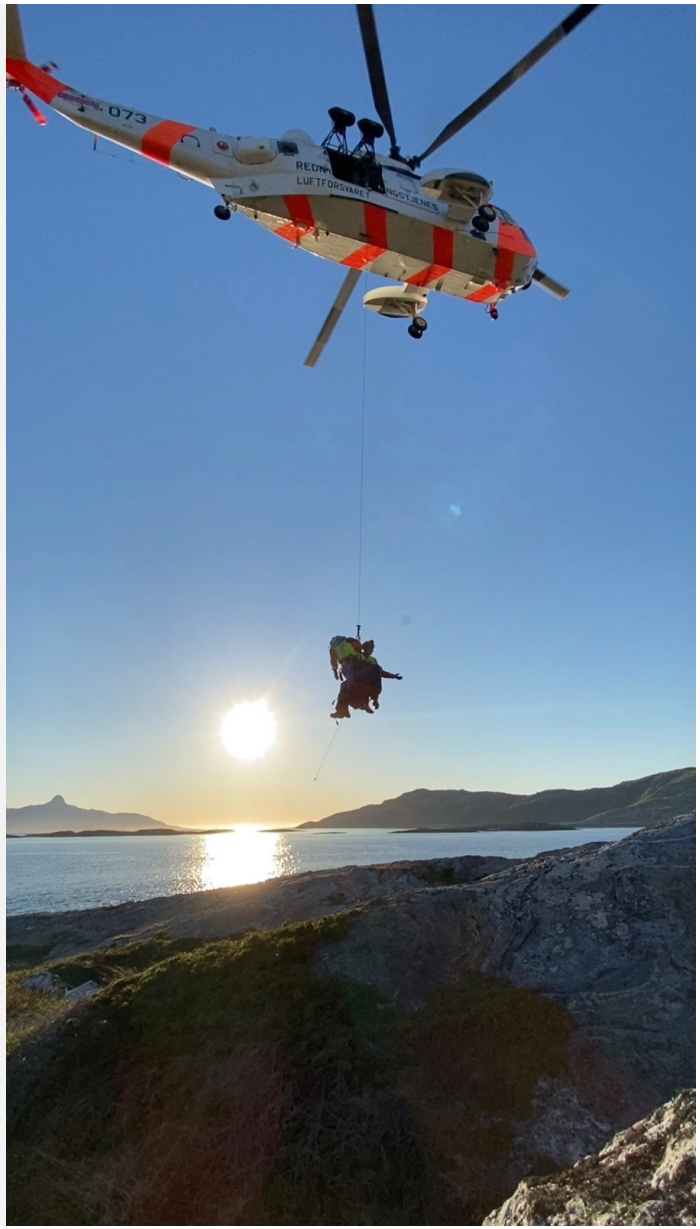
- Hoisting with wire (standard operation)
  - Fast
  - Low risk
- Super Long Line (SLL)
  - Takes minimum 4 – 6 climbers to deploy rope
  - Time consuming
  - Risk of rope entanglement
  - More complex than DSLL
- Directly Delivered Super Long Line (DSLL)
  - Smaller ground team (1-2 climbers, or rescueman and doctor)
  - Faster than SLL

Goal: Lower risk for fewer rescue personell in a shorter period of time, and the patient faster to hospital

Hoisting with wire

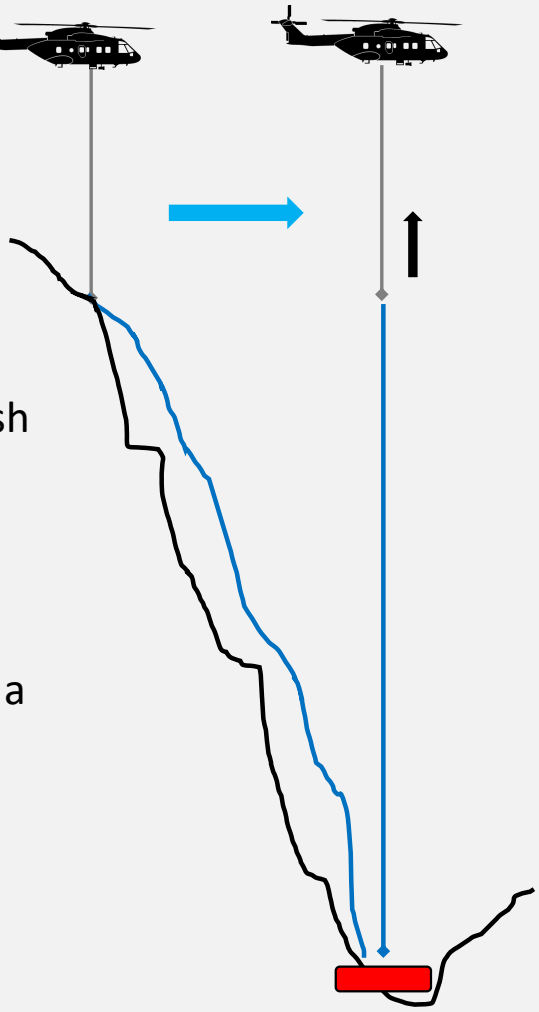
- Dynamic or stationary hoisting
- Wire length 90 meters / 270 ft. (AW101)
- 98% + of all alpine rescue missions are solved by using the rescue hoist only
- Can be combined with rescue technical ground access, securing the patient, followed by hoisting





Super Long Line - SLL

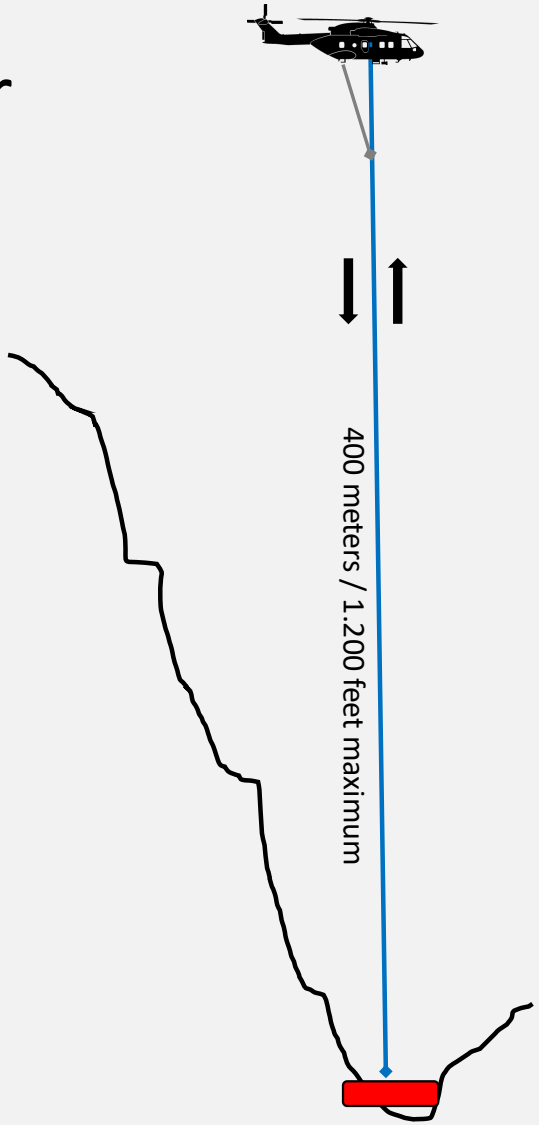
- Procedure invented in the early ‘90s
- Presented at ICAR Andorra 2017
- Well known, and proven over time
- Alpine rescue climbers (NARG*) establish long ropes from pick up point to the scene of the accident
- Helicopter picks up the rope using the hoist
- Hauling the rope by using the hoist and a rope clamp (photo)
- Theoretically no limitations in rope length, but realistically maximum 800 – 1000 meters / 2.400-3.000 ft.



*) NARG: Norske Alpine Redningsgrupper – Norwegian Alpine Rescue Climbers

Directly Delivered Super Long Line - DSLL

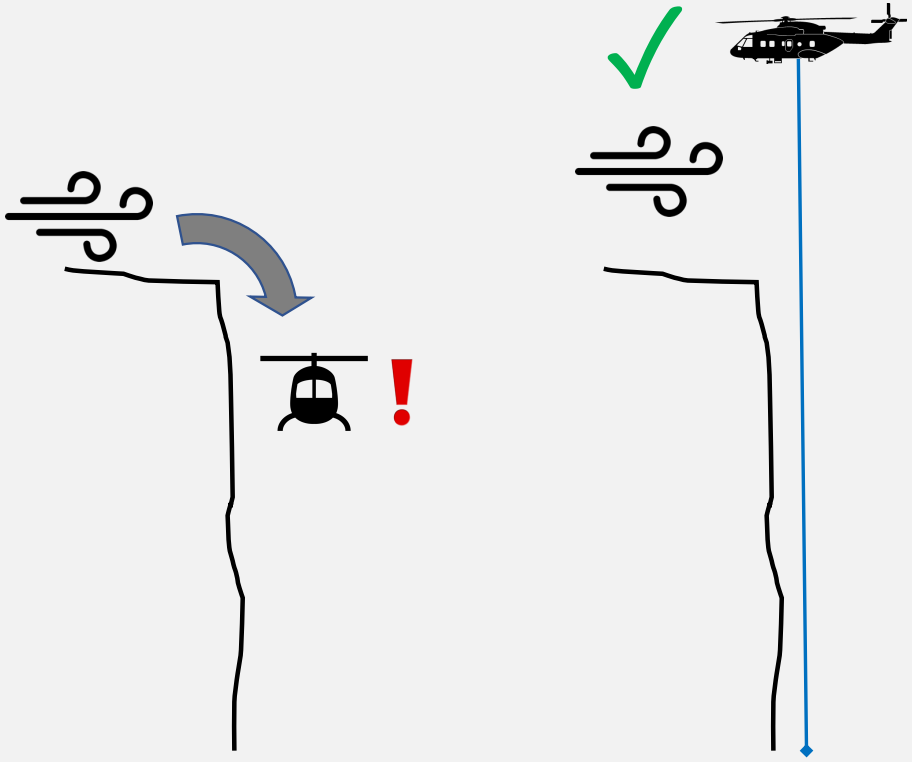
- New procedure implemented in 2021
- Rope delivered directly from helicopter to the scene of the accident
- Load is hauled by using the hoist and a rope clamp, well known from the SLL-procedure
- Limitation 400 m. / 1.200 ft.
- Can be performed both with assitance by NARG, and by crew only:
  - NARG can access patient and perform first aid and rescue while waiting for the helicopter
  - The helicopter crew can perform this procedure with the rescueman and the doctor accessing the patient



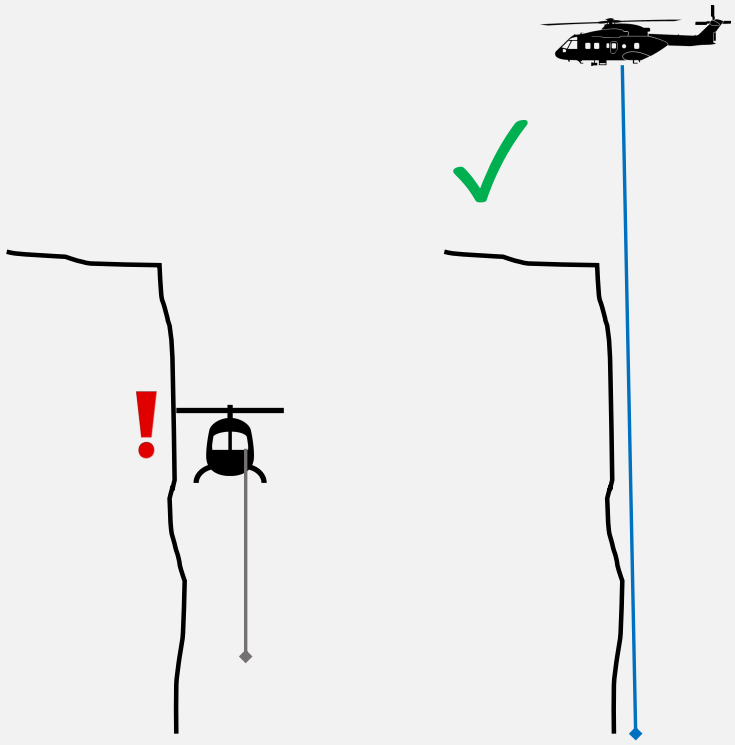
WHY LONG ROPE RESCUE TECHNIQUES?

SAFETY **EFFICIENCY**

MOUNTAIN WINDS



CLEARANCE ROTOR-TERRAIN



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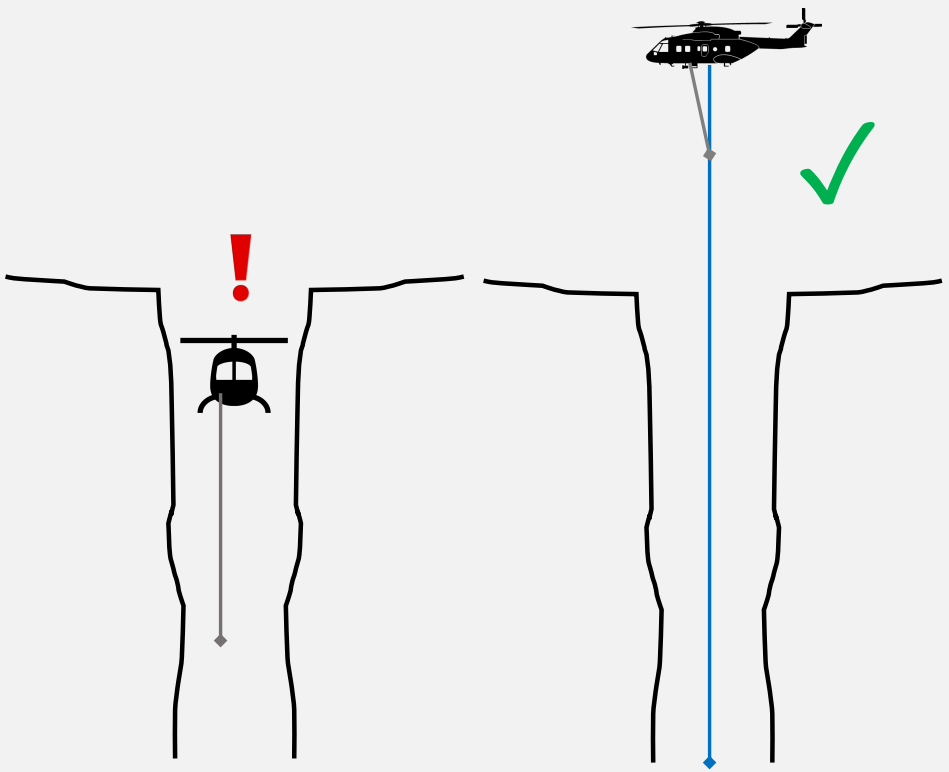
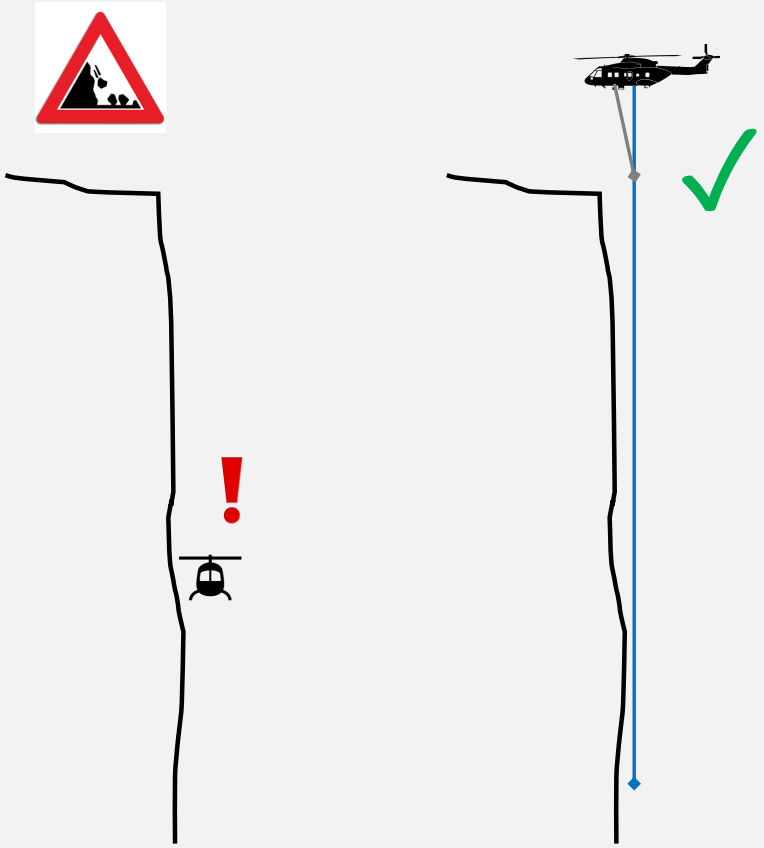


FALLING OBJECTS

(ROCKS, ICE, SNOW, TREES, ETC.)

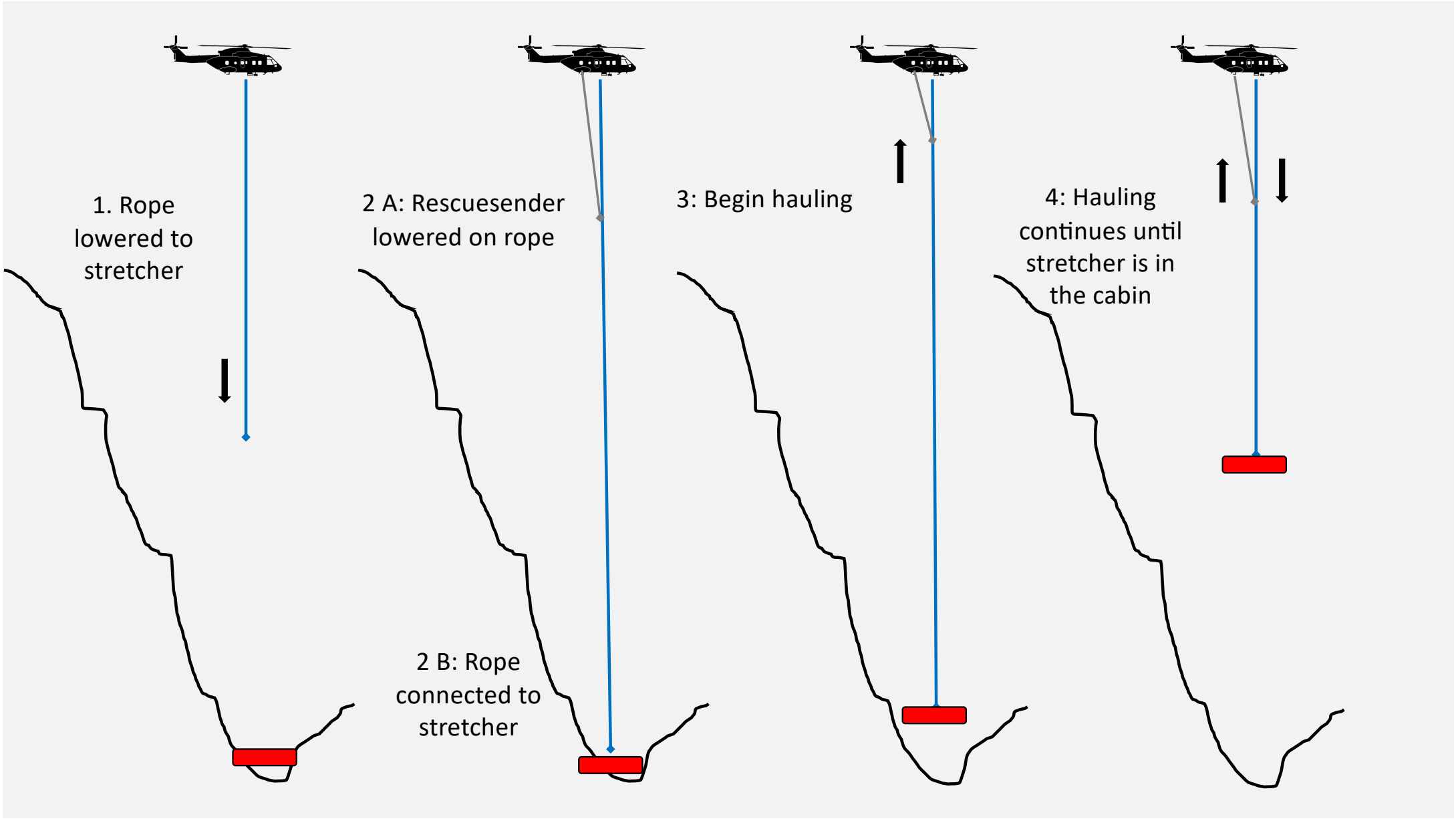


HELICOPTER DOWNWASH

THE DSLL PROCEDURE STEP BY STEP

WARNING !

For informational purposes only!


1. Rope lowered to stretcher
2 A: Rescuesender lowered on rope
2 B: Rope connected to stretcher
3: Begin hauling
4: Hauling continues until stretcher is in the cabin

MAIN COMPONENTS USED FOR DSLL

CMC CLUTCH
Pulley / Ascender / Decender

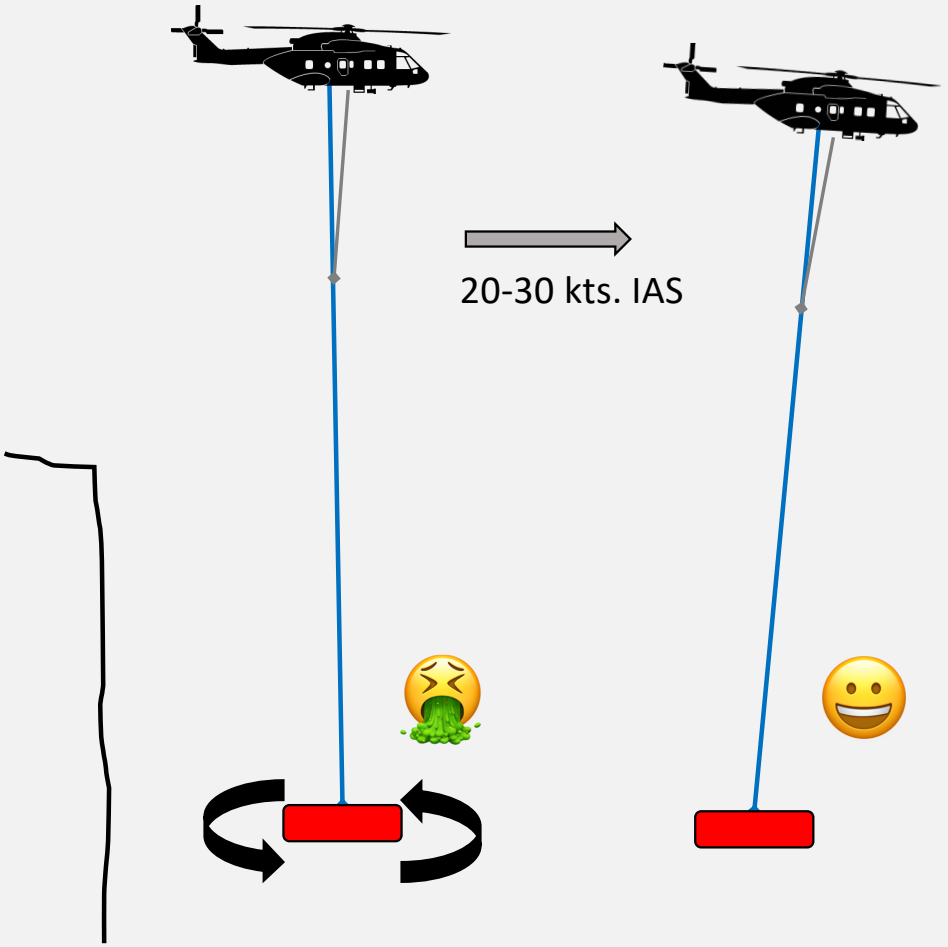
Petzl RESCUSENDER
Rope Clamp

Petzl SWIVEL
Petzl AM’D

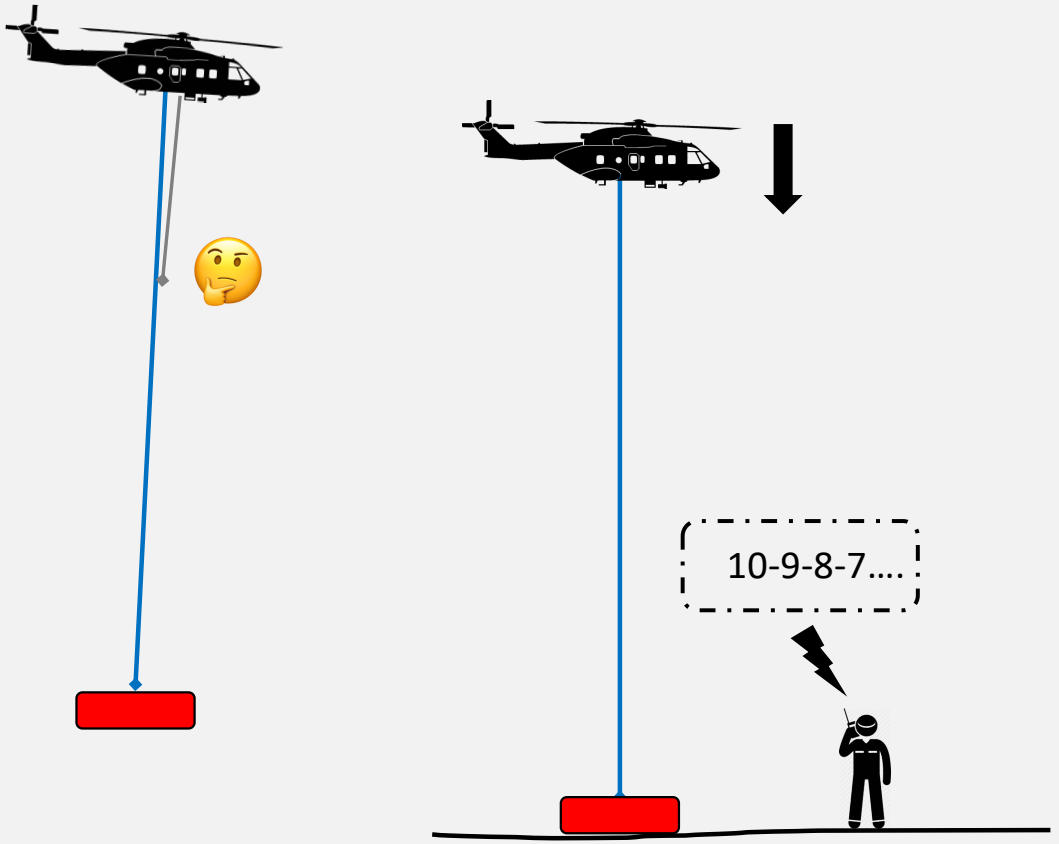
High visibility flag

Semi-static rope

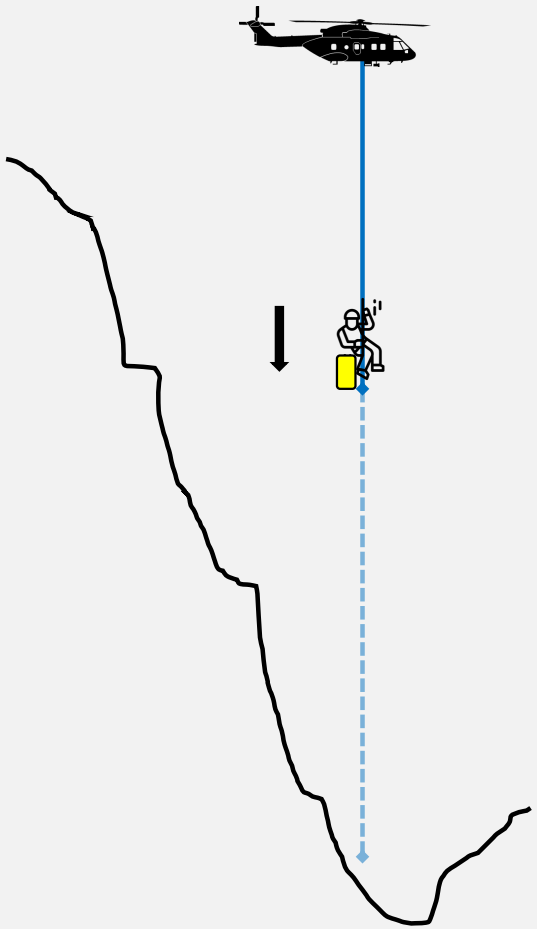
AVOIDING AND DEALING WITH SPIN

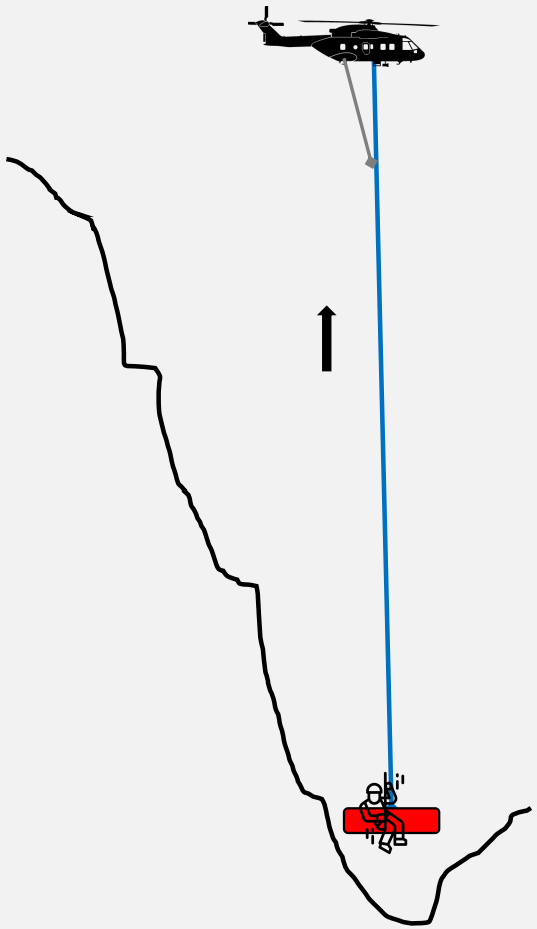


STUCK HOIST?
→ SLING LOAD PATIENT DELIVERY



THE FUTURE: RAPELLING FOLLOWED BY HOISTING?





And now a 6-minute Video Presentation


FIRE
ACCESS
HANDHOLD
MAX ONE PERSON
MAX LOAD 80KG

330 Skvadron
Sola flystasjon
4050 SOLA
Norway