



AIR RESCUE REPORT

International Commission for Alpine Rescue (ICAR)
Kommission für Luftrettung/Commission pour le Sauvetage Aérien

October 18-21, 2017
Soldeu, Andorra

PREPARED BY:

Brian Webster

Safety Specialist
Parks Canada
Box 900, Banff, AB
Canada T1L 1K2
Brian.webster@pc.gc.ca

Charley Shimanski

Mountain Rescue Program Coordinator;
Flight For Life Colorado
67 Pauls Road, Evergreen, Colorado 80439
USA
charley.shimanski@gmail.com

Introduction

The International Committee for Alpine Rescue (ICAR) annual meeting was held in Soldeu, Andorra from October 18-21, 2017. The event was hosted by the Mountain Rescue Group of the Bombers (fire department – Bombers d’Andorra / Grup Rescat de Muntanya - <https://www.bombers.ad>)

The Air-Rescue Commission was attended by a record of 52 delegates representing 17 countries (Austria, Bulgaria, Canada, Croatia, Czech Republic, France, Germany, Italy, Norway, Poland, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, and USA). The Air Rescue Commission was chaired by Patrick Fauchère (KWRO/OCVS, Switzerland).

Air Rescue Commission presentations took place over three days. On Thursday, October 19, the Commission met separately to discuss rescue accidents and hear presentations on rescue hazards and procedures. The afternoon of October 19th and October 20th included a few presentations held jointly with the ICAR Terrestrial Commission as well.

Air Rescue Commission President

Patrick Fauchère

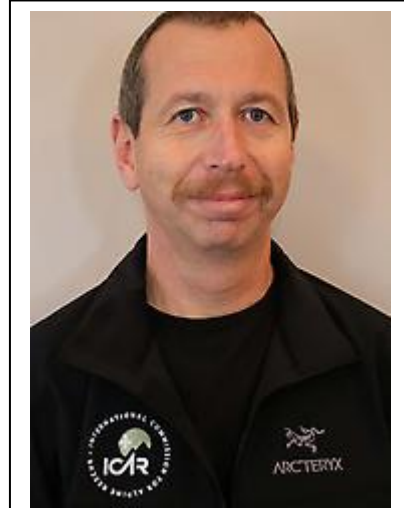
Flight Operations Manager; Air-Glaciers

Patrick Fauchère is the President of the ICAR Air Rescue Commission.

Patrick has been a helicopter crew member since 1981, and a pilot since 1989. He has more than 11,000 hours as a helicopter pilot, all in mountain areas (Switzerland, India, and Bhutan). 3,200 of those hours have been under rescue missions, including 2,000 HHO or HEC missions.

Patrick has been a delegate to the ICAR Air Rescue Commission since 1999, -Vice President of the ICAR Air Rescue Commission from 2004-2008, and President of the Air Rescue commission since 2008.

Professionally, Patrick served from 2004-2012 as Flight Safety Manager of Air Glaciers, Switzerland, and as their Flight Operations Manager since 2012.



Patrick Fauchère
ICAR Air Rescue
Commission President



Patrick is a board member of the Swiss Helicopter Association and the European Helicopter Association (EHA), and serves as the EHA Delegate at the EASA (European Aviation Safety Agency). He participates in different working groups at EASA (SPO, HEMS, PCDS).

After ten years as ICAR Air Rescue commission President, Patrick has announced his retirement as Commission President following the 2018 Congress in Chamonix.

Air Rescue Commission Presentations

In addition to this written narrative summary of the Air Rescue Commission proceedings, Air Rescue Commission delegates are given separate access to the PowerPoint and other electronic presentations made by delegates, when those presentations can be made available.

Congress Video

Once again, Topograph Media developed an extraordinary video recap of the conference, with thanks to their loyal 2017 Sponsors Petzl, PMI and TYROMONT. The Two Part Series is available at these links:

- [ICAR 2017 Andorra Video by Topograph Media Part 1](#)
- [ICAR 2017 Andorra Video by Topograph Media Part 2](#)

Field Demonstration by Host Team

Bombers d'Andorra / Grup Rescat de Muntanya

On the opening evening of the Congress, Bombers d'Andorra / Grup Rescat de Muntanya entertained the entire Assembly of Delegates with live two demonstrations.

One of the demonstrations was of a rescuer being inserted by helicopter hoist to a subject suspended from a chairlift cable.

Once free of the helicopter hoist system, the rescuer then rigged a separate system to lower the subject to the ground.



During the Friday evening social hour, the host team demonstrated a rescue of a subject from a cable.

Incidents and Accidents

The following reports were presented during the Air Rescue Commission meetings by the Commission delegates from several countries:

Switzerland

Incorrect Engine Start Procedure

In a high stress rescue situation in bad weather, the pilot failed to engage the second engine of an EC135 at the start of mission. Shortly after take-off, the pilot noticed the second engine was not engaged to flight mode and landed the aircraft without incident. The helicopter was checked over. Usage Monitoring System (UMS) showed no over-limits. The helicopter was released to service the next day. This incident could have been prevented if a checklist protocol had been utilized in the start-up procedure.

France

Cable Strike/Damaged Aircraft

Shortly after takeoff from a rescue operation, the main rotor struck an electrical cable resulting in damage to the helicopter. There were no injuries. The pilot was familiar with the terrain, and the hoist operator was new to the program. The aircraft returned to the original landing zone. The rotor blades were replaced.

Italy

Helicopter Crash

In January, during an avalanche response in the Dolomites a helicopter crashed resulting in six fatalities (investigation still on-going). Response to an Avalanche in the Dolomites. Six fatalities, and an investigation is still underway. There were two contributing issues (high stress rescue operation and bad weather). The plan was to perform a short winch operation. The aircraft flew into terrain, and was destroyed. The rescuer, dog handler, doctor, paramedic, hoist operator and pilot were all killed.

Canada

Helicopter Crash/Lost Reference

While heli-skiing in western Canada the pilot and guide decided to go to a non-standard landing (landing that had not been staked with landing flags). There was about 50 cm of fresh low density snow. Pilot used a tree outside of the rotor disk for reference, but while landing reference was lost due to blowing snow. The pilot hovered for about 40 seconds and then started drifting sideways, caught a skid and rolled the helicopter. One person was significantly injured.

Class D Operation/Rotor Strike with Rock

While performing a fixed line Class D mission on a steep rock face, the helicopter blades struck the cliff face. The pilot was able to maintain control of the aircraft, drop the rescuer off and then land without further incident. There were no injuries, but the aircraft suffered significant damage. The pilot described reacting to a wind gust prior to the blade strike.

The conclusion was that there was not enough rotor clearance for safe operations. A suggestion was made that in steep terrain sling operations, a “dry run” is conducted (with no rescuer on line) in order for the pilot to get a better sense of operational limits.



Moments after this photograph was taken, this helicopter's main rotor blades struck the rock at the 3 o'clock position during an attempt to insert a rescuer on a longline. There were no injuries, but the aircraft suffered significant damage

Norway

Class D Operation/Rotor Strike with Tree

Norwegian Air Ambulance-While conducting a Class D mission in narrow terrain, the helicopter's rotors hit a tree. The aircraft lost control and dragged the rescuer and patient through the trees. There were no injuries. The incident was associated with not following SOP's for the procedure.

The program has a procedure to always to perform a "ROPE Rescue" Checklist/Safety Check.

ROPE is an acronym as follows:

- R = Reconnaissance of the area
- O = Operating Procedure assessment
- P = Power check
- E = Entry and Exit assessment

The crew neglected to perform this ROPE checklist.

After this accident report, there was a discussion in the Air Rescue Commission about the idea of using checklists more universally.

France

Hoist Incident/Entanglement

While conducting a rescue mission (in 2016) in the Mont Blanc area at 12,000 feet, a rescuer and three uninjured mountaineers were being hoisted up to the helicopter. An entanglement issue resulted in 4 people being lifted on the cable (the pilot expected only 3 people). The maximum load on the winch was exceeded and the pilot experienced the helicopter descending.

The pilot performed an emergency landing at Midi Pass at 10,000 feet. There were no injuries or damage to the aircraft. The program replaced the hoist.

Austria

Class D Operation/Lost Power

While conducting a fixed line operation at 7300' the pilot lost power in a down draft. The rescuer and two patients who were on the line hit the ground and were dragged across the ground before the rope was cut by sharp rocks. The rescuer and one patient were killed. The second patient was seriously injured. There was no damage to the aircraft.

Helicopter Crash/Lost Tail Rotor Effectiveness

An Austrian rescue helicopter (MD902) with three persons on board landed at an alpine shelter at 11,300 feet (+7 degrees C) to pick up one patient with a suspected heart attack. When the helicopter attempted to take off after loading the patient, tail rotor effectiveness was lost, the aircraft began to turn in a clockwise direction and then tipped to the side and crashed. There was one injury.



Quelle: ORF.at

United States Possible Engine Failure

Saint Louis, Missouri - Kids Flight (July, 2017)-A HEMS flight The inter-hospital flight with this aircraft (BK117 B-1) took off at 2019 hrs for St. Louis (MO) Children's Hospital. The pilot reported that the helicopter "experienced a sharp change in attitude yawing to the left with a hard-upward bump" followed by a change in the engine noise. The No. 1 engine low warning light, the No. 1 generator light, and the battery discharge warning lights were illuminated. He entered an autorotation by applying right forward cyclic and lowering the collective to full down.

The helicopter landed right skid low and skidded for about 100 ft. The main rotor blades hit the ground as the helicopter rolled onto its right side. The pilot and flight crew, with the patient on a stretcher, egressed the helicopter with minimal injuries.

Another Possible Engine Failure

Duke University, "Life Flight" – Perquimans County, North Carolina (September 8, 2017) – The MBB BK117-C2 helicopter, N146DU, was en route to Duke University Hospital from Sentara Albemarle Medical Center. Several witnesses reported observing "heavy/dark" smoke trailing behind the helicopter, also a "popping noise," They then watched it turn twice and descend before it disappeared from sight. The pilot, two flight nurses, and the patient died in the crash.



Hoist Fatality – Fall to the Ground

Fort Hood Texas, US Army (September 12, 2017) – During a medical evacuation hoist training a soldier fell from the hoist to his death. An Investigation is underway and no further information exists.

Scotland

Report Released on Rescue Accident

Ben Nevis, Scotland (February 13, 2013) A long-overdue Service Inquiry Report was released by the UK government January 2017. The incident involved a RAF Sea King that was dispatched to rescue a fallen climber on Ben Nevis in Scotland following an ice climbing fall on lead. A rescue helicopter from RAF Lossiemouth was trying to get him on board when the safety rope was severed before he had been secured. The victim fell hundreds of feet to his death. Contributing Cause Summary*:

- The winchman (hoist rescuer) verbally "expressed concern at the complexity of the rescue" to the flight crew raising the option of involving the ground rescue team.
- Complexity of the rope system encountered by the winchman upon reaching the accident scene.
- Investigative conclusion of winchman feeling a "perceived pressure to perform"
- Failure to follow pre-existing established procedural sequence of
 - Strop (placed on casualty)
 - Connect (strop to hoist hook)
 - Cut (ropes attached to casualty)"

Mexico

Flight into Power Lines

Mexicali, Mexico - Hughes MD 530 - El Centinela Hills in Mexicali, A hiker had died from injuries sustained when she fell into a gorge.

The government says the crew had found the woman's body and was bringing back rescue workers when the helicopter hit an electrical power cable. All four on board died.



Four rescuers were killed in the crash of this helicopter when it encountered power lines during a body recovery of a deceased hiker.

Joint Presentations with the ICAR Terrestrial Commission

Several presentations relative to helicopter Human External Cargo (HEC) were made to joint sessions of the Air Rescue and Terrestrial Rescue Commissions.

Yosemite Offset Technique

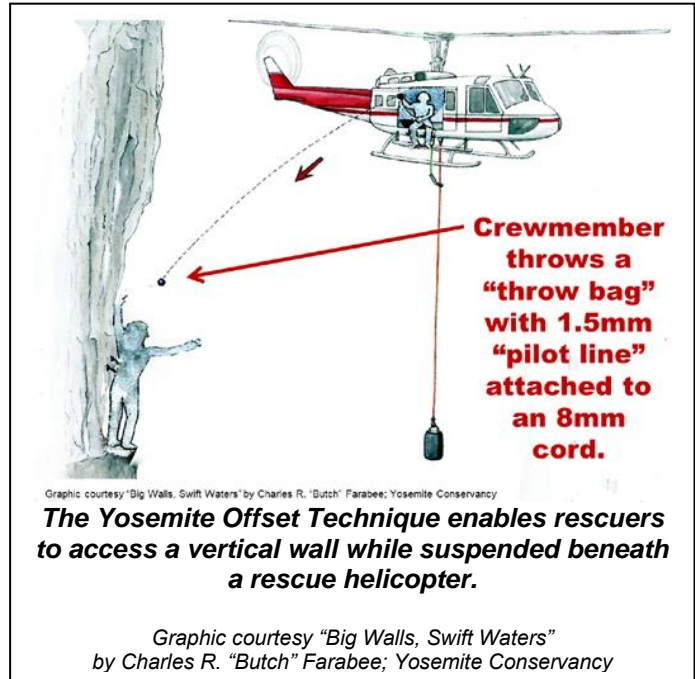
By Charley Shimanski, USA Mountain Rescue Association

Charley Shimanski presented The Yosemite “Offset Technique” was presented, including video of the technique in action in Yosemite National Park. The “Big Walls” of Yosemite National Park include El Capitan, which is 3,000 vertical feet of granite.

A rescuer suspended below the helicopter, or a crewmember on board the helicopter, throws a “throw bag” with 1.5 mm “pilot line” attached to an 8 mm cord. The line is then ultimately pulled over to the wall. A rescuer can then be pulled over to the site.

Occasionally, the subject can self-rescue by pulling over a gear bag that contains survival gear or replaces lost climbing gear.

The technique is far more complicated than the description above, and rescuers are encouraged to watch the [Yosemite Offset Technique video](https://vimeo.com/221000643) on Vimeo. (<https://vimeo.com/221000643>)



Rescue techniques in Big Walls

Theo Maurer, Head of Training (Swiss Alpine Rescue), and Mountain guide

Theo Maurer presented techniques used by Alpine Rettung Schweiz for Big Wall rescues, including mountains like Wendenstöcke (200 – 300 metres vertical, overhanging) and Eiger - North Face (1800 metres rock, snow, ice). These included 1) Helicopter with a rescue winch (winch rope up to 85 metres long) and 2) Helicopter with a longline on a

central hook (rope length up to 230 metres). Mr. Maurer then profiled an example of a rescue of a BASE jumper on Lauterbrunnen that included a particularly complicated rescue of a survivor below a 25 metre overhang.

Air Rescue Commission Presentations

High-line Rescue Demonstration

By **Renaud Guillermet (France)**

This presentation acknowledged the increase of high-lines being set up in the high mountains and the expectation that sooner or later someone would have to be rescued from them. A rescue scenario was set up where a rescuer was lowered onto a highline by a hoist helicopter. The rescuer treated the patient and then patient and rescuer were hoisted off the high-line. Discussion revolved around integrity of the high-line and the need for rescuer staying attached to helicopter while preparing patient for evacuation.

Overview of BASE

Jumping in Norway

By **Dan Halvorson**

This presentation gave a summary of base jumping in Norway and spoke to the number of fatalities (34 fatalities from 1978-2017) and the need for rescuers to conduct rescues or recoveries in steep mountain terrain often in areas where climbers do not go. There are local demands within Norway calling for regulation or prohibition of Base jumping.

Concerns from a rescuer standpoint were:

- Difficult and dangerous access to victim
- Is the victim alive or deceased (difficult decision from the helicopter window).

The risk of getting too close with the helicopter and re-inflating the parachute and blowing patient or body away was discussed. (The presentation profiled one case where a body (deceased) was blown away by downwash from the helicopter.)



Dan Halvorson presented policies and procedures for rescuing and recovering BASE jumpers in Norway

Super Long-line Procedure and Rescue in Norway

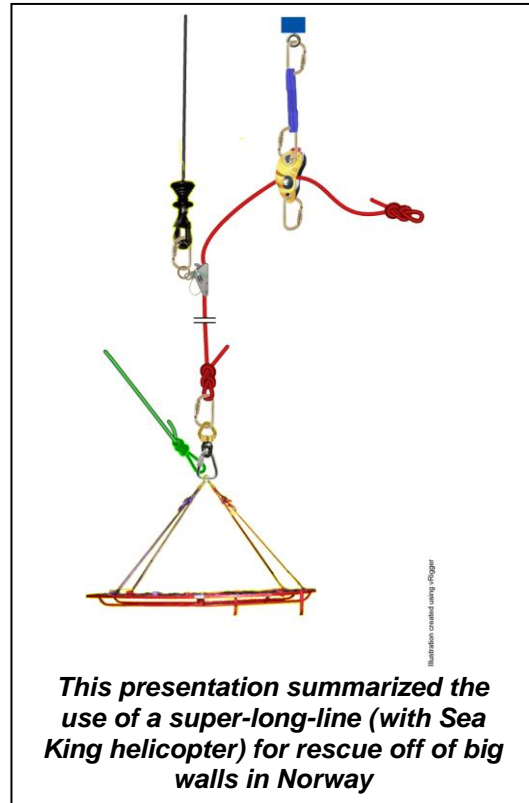
By Stein Faisen Mollar (Norway) and Fredrik Jomaas Major

This presentation summarized the use of a super-long-line (with Sea King helicopter) for rescue off of big walls in Norway. This technique is a rope extension to the hoist cable and allows the helicopter to stay above the rim of the wall.

Advantages are

- Helicopter does not have to descend along the wall
- Helicopter can hover above difficult wind conditions
- Less down-wash on accident site
- Less rock fall hazard
- Reduces potential for blade strikes
- Facilitates rescue in very steep terrain

Once the rescuer and patient are suspended on the super-long-line then the load and rope can be hoisted into the helicopter.



Review of Sea King and AW 101 Helicopters in Norwegian Military

By Major Fredrik Jomaas

This presentation summarized the use of the Westland Sea King helicopter in the Norwegian military and its current transition to a new helicopter (the Augusta Westland AW 101). The Sea Kings have been in service since 1973 and have logged 40,000 missions. The military received their first AW 101 in 2017 and expect to complete the transition of the new helicopter to all six of their bases by 2020. "there is a transfer of 45 years of experience (with the Sea King to the AW 101) in three years.

Study on Rotor Wash Effect on BASE-Jumper Parachute

By Major Fredrik Jomaas

This presentation examines and compares the effect of downwash on a deployed base jumper's parachute (attached to a simulated person) by a Sea King helicopter (8500 kg) and an EC 135 helicopter (2600 Kg). Not surprisingly the Sea King's downwash inflated the chute and caused movement sooner than the EC 135 but what was surprising is that both helicopters inflated the chute and caused movement from as far away as 400 feet. Also of note is the chute remained inflated for a period of time after the helicopter had left. The take home from this study is that you cannot get close to a base-jumper accident site (where the chute is deployed) with a helicopter without risking moving the subject.

Movement of BASE-jumper Chute by Helicopter

	Sea King	EC 135
400 feet	One min 40 sec. Moved 15 m.	4 Min 30 sec. Moved 5 m
300 feet	60 sec. Sudden move	2.5 min. Sudden move 15 m
200 feet	20 sec. Sudden move	45 second. Sudden movement >15 m
120 feet	6-8 sec. Tight rope	15 sec. Tight rope

Overview of SAR and Air Ambulance (HEMS) Operations in Norway

By Dan Halvorson (Norway)

There is national coordination and management between military SAR assets (RNoAF 330sqn) and state operated Air Ambulance (HEMS) service.

- SAR units do 55% HEMS missions
- HMS units do 5% SAR missions

Air Ambulance is state operated on contract with civilian HEMS operators. The current contract expires in 2018

New contract for 2018,

- Expect to cost 375 euros
- Tender has 500 requirements
- Helicopters include H135, H145, and AW 139
- Will have SAR capacity
- Will have IFR capacity



Texbor Smart Sling For Class D

Smart-Sling presentation

The Manufacturer presented their Smart Sling product.

Vortex Discussion

www.vrasf.org

A film was presented that illustrates Vortex Ring State/Settling under power. The film was shot with a spray helicopter and perfectly shows the effect of the vortex ring state on an aircraft. The recovery technique shown allows the pilot to get out of such state rapidly.

Rope Test by Airwork& Heliseilerei Gmbh

Airwork & Heliseileirei

Airwork & Heliseileirei presented a test they did in reaction to the Austrian HEC accident (see above). The test shows 3 different ropes used for HEC operations (2 with core and cover bearing and one with only the core bearing the load). The purpose of the test was to evaluate the reaction of the core to cutting. The results were significant as the 2 core and cover-bearing rope failed quickly while the loss of cover on the core-bearing (only) rope experienced less consequences.

A video will be included in downloadable Dropbox files available to ICAR Air Rescue Commission Delegates.

2018 ICAR

The 2018 ICAR Congress will be held in Chamonix, France.

For further information regarding this report, contact:

Brian Webster

Safety Specialist
Parks Canada
Box 900, Banff, AB
Canada T1L 1K2
Brian.webster@pc.gc.ca

Charley Shimanski

Mountain Rescue Program Coordinator;
Flight For Life Colorado
67 Pauls Road, Evergreen, Colorado 80439
USA
charley.shimanski@gmail.com