

REPORT OF THE AIR RESCUE COMMISSION

International Commission for Alpine Rescue (ICAR)

**October 8-12, 2019
Zakopane, Poland**

PREPARED BY:

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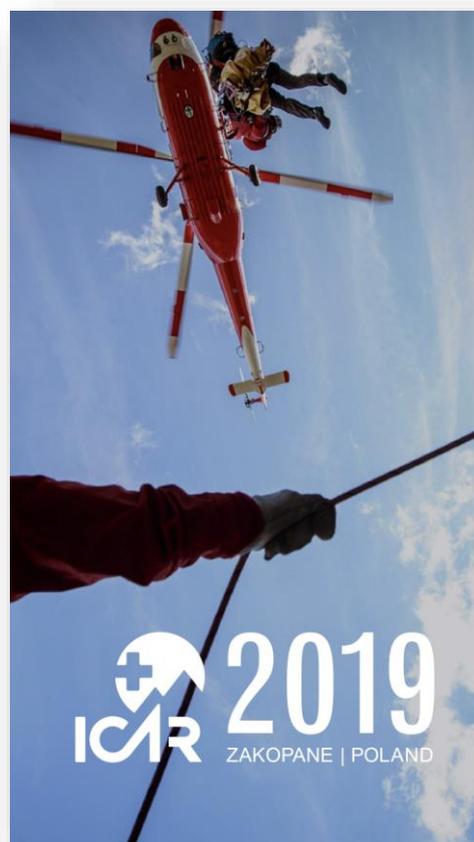
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Introduction

The International Committee for Alpine Rescue (ICAR) Congress was held in Zakopane Poland on 8-12 October 2019. The Congress was hosted by Tatra Mountain Search and Rescue (Tatrzańskie Ochotnicze Pogotowie Ratunkowe (TOPR)), and included 440 rescue professionals from 109 rescue organisations, representing 37 countries.

2019 marked the 71st anniversary of ICAR, and the Congress was a prodigious event and yet another opportunity to share techniques and discuss how to improve the safety of mountain rescue personnel. A record number of participants – pilots, rescuers, technicians, and medics) took part in the Air Rescue Commission sessions.

With a theme of “TEAMWORK”, the convention started with a full day of practical workshops in the field and continued with three days of seminars inside the Nosalowy Dwór Resort in Zakopane. Four rescue helicopters from four different countries participated in rescue demonstrations and test flights.





Conference program

This year, 90 representatives from 27 countries and 67 rescue agencies participated in ICAR Air Rescue Commission sessions. Presentations by an assortment of rescue experts worldwide included reports on:

- Accidents and incidents in 2018 and 2019
- VFR air-to-air collision prevention/Limitations of 'see and avoid'
- A 1,000-meter longline recovery in Norway
- Drones as assets and hazards
- Teamwork in HEMS
- Critical incident support – psychological first aid

Attendance by Three Helicopter Manufacturers and TOPR

The ICAR Congress also included special onsite presentations of helicopters and rescue programs representing Airbus Helicopters (through EliFriulia), Bell Helicopters (through ATE Poprad, Slovakia), and Leonardo Helicopters (through Alidaunia), and Tatra Mountain Search and Rescue (Tatrzańskie Ochotnicze Pogotowie Ratunkowe (TOPR). Air Rescue Commission delegates and pilots experienced these helicopters first-hand, through live test flight operations and field demonstrations. The Grand Nosalowy Dwór hotel was the perfect venue, as it included a helipad and other open spaces that were suitable to host three helicopters at the same time.



Special Presentations by the European Aviation Safety Agency (EASA)

Fabrice Legay, Section Manager - Medium & Light Rotorcraft for EASA (European Aviation Safety Agency), led the most significant presentations during the Air Rescue Commission sessions; his presentations on key areas of focus by EASA were well received by attendees. The collaboration between EASA and the ICAR Air Rescue Commission (AirCom) is important, and our partnership was further strengthened by his presence. Air Rescue Commission Vice

President Renaud Guillermet, Chief Pilot at the Grenoble France Base of Sécurité Civile, leads the Air Rescue Commission work with EASA.

Practical Workshop



The practical workshop took place on the opening day. The majority of Congress participants enjoyed a day of seven technical rescue stations.

At the Practical Workshop site, Leonardo Helicopters (through Alidaunia) performed two hoist demonstrations, including a hoist insertion of a rescuer, and extraction of a mock injured subject and rescuer. The host team of Tatra Mountain Search and Rescue (TOPR) also performed an impressive medical packaging and hoist demonstration. Rescuers from Alidaunia also performed a rescuer insertion and hoist demonstration as part of the practical exercise.

Earlier in the morning, Airbus treated more than 20 AirCom pilots to test flights of the Airbus H-145T2 through EliFriulia, an Italian rescue service. We are grateful to Airbus for their support, as well as to Leonardo Helicopters (through Alidaunia) who also provided several test flights.

REMEMBERING NICOLAS REVELLO

During the 2019 Congress, ICAR participants learned of the tragic death of Nicolas Revello, a French police rescuer with *CRS Secours en Montagne* in France. "Nico" died on 11 October while working to rescue two alpinists at the summit of Barre des Ecrins. His sacrifice was a somber reminder of the dangerous work performed by helicopter rescue mountaineers. Our hearts go out to Nico's family, and his colleagues in the rescue communities of Grenoble, France.





Air Rescue Commission Report

ICAR AirCom President Charley Shimanski and Vice President Renaud Guillermet presided over the meeting of the Air Rescue Commission. The AirCom had been led for the prior ten years by Patrick Fauchère, who had 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. The ICAR Air Rescue Commission extends its heartfelt gratitude to Pat Fauchère for his leadership.

Dropbox Basecamp

In addition to this written narrative summary of the Air Rescue Commission proceedings, AirCom delegates receive separate access to the AirCom “Dropbox Basecamp,” where PowerPoint and other electronic presentations are made available for download.



**Charley
Shimanski**
ICAR Air Rescue
Commission President

**Renaud
Guillermet**
ICAR Air Rescue
Commission Vice
President





2019 Presentations

Air Rescue Incidents and Accidents

Detailed below are summaries of the Air Rescue Commission presentations made in Chamonix.

FRANCE

Maintenance Issue (BK117 C2)

A tail rotor blade was mounted “upside down.” The pilot felt vibrations during start up and aborted the flight. Three mechanics and a pilot had worked and checked the aircraft, and none had seen the wrong mounting. The problem was corrected without incident.

Rescue Device Misuse

During a rescue training operation, a rescue strap was used incorrectly despite a proper Rescue strap use briefing.

Whatever the reason for the mistake, rescuers note that the “2 step” check prior to achieving up-winch sequence is a MANDATORY safety key:

- 1st check
 - rescue device(s) connection ok
 - “ready for lift-off” sign
- 2nd check:
 - Once cable tensed - 1 meter above ground
 - connection still ok “lift-off” sign

Rotor Wash #1 (BK117 C2)

A private HEMS Operator aircraft was on short final on field landing zone. Due to the rotor wash, a foreign object was snatched from a house and collided with the main rotor. The aircraft had an uncontrolled 180° turn, and the pilot engaged an emergency landing. There were no injuries.

Rotor Wash #2 (BK117 C2)

During a rescue effort and while landing at 6,000 feet under NVG, the rotor wash blew pieces of wood which came in contact with the main rotor just before landing. There was no damage and no injuries

Rotor Wash #3 (BK117 C2)

During a hoist operation, a small tree (Φ 25 cm) created a problem due to rotten wood (rock impacts). The rotor wash and Venturi effect caused the tree to fall. Two rescuers on the ground were injured. The final extraction required a hovering height of 120 meters.

Power Line Strike (BK117 C2)

During the rescue of a subject on an abandoned boat at sea near shoreline, the crew was hoisting the subject and rescuer when the aircraft came in contact with a power line. The crew onboard (pilot and hoist operator) were not aware of the power line. The hoist cable was cut by the power line contact.



The rescuer and subject fell 15 meters into the water below. They swam safely to shore. There were no injuries.

Wire Strike (BK117 C2)

During the rescue operation the helicopter has collided with a wood extraction wire. This has resulted in severe damages and fortunately no injuries.

Power Line Electrical Hazard (BK117 C2)

During very short final in a rescue effort, the pilot elected to fly over power line pole. An electric arc occurred. The electric supplier indicates there is a significant risk when flying less than 5 meters from power lines. There were no injuries / and no damage.

Other Events

Other events occurred involving French manufactured helicopters (with reliable info from the French safety board website). These included seven Cable / power line strikes, one PIO or ground resonance incident and one incident where a pilot was incapacitated.

USA INCIDENTS AND ACCIDENTS

Rescue Helicopter Crashes Trying to Rescue a Helicopter Crash Casualty (October 3, 2019 – Polk County, Florida)

A Polk County Sheriff's Office helicopter crash-landed into a swampy field while responding to an earlier gyrocopter crash.

A Coast Guard Air Station Clearwater MH-60 Jayhawk helicopter aircrew rescued two pilots from two helicopter crashes. The two subjects were transported to Tampa General Hospital. The rescue pilot was treated and released; the gyrocopter pilot remained in the hospital.



Helicopter Hits a Firetruck (December 24, 2018 – Strum, Wisconsin)

The crew of the BK117 was responding to a scene call. The decision was made to land at an alternate landing zone in front of the fire station instead of a pre-established landing area one mile away.

The approach was made under NVG. The pilot stopped his approach 3 feet above ground to avoid an unreported obstacle at the leading edge of the landing zone. The tail rotor made contact with the top of a fire truck parked to block the street at one end of the landing zone.

The pilot lost tail rotor control and the aircraft nose spun to the right. The pilot immediately lowered the collective and impacted the ground. The aircraft rotated approximately 225 degrees before coming to a complete stop. The pilot performed an emergency shut down and the crew exited the aircraft once the rotor blades stopped.



According to persons involved, “the ground party did not establish landing zone using common practices to set the proper size and identify obstacles. It is imperative that... aviation programs provide landing zone safety training. The ground staff on site had not received training to develop a landing zone.”

Once the crew agreed to land at the smaller landing zone, they acknowledged that it seemed smaller than normal. The crew continued to consider options of going to the previously established landing zone instead of focusing on landing area they had chosen. Because of this, they did not discuss the obstacles in the landing zone... and did not maintain situational awareness once they were committed to the landing zone.

Program Accepts a Call that 2 Other Programs Refused Due to Weather (January 29, 2019 – Zaleski, Ohio)

This HEMS Survival Flight Inc. helicopter was headed to pick up a patient from a hospital in Pomeroy, Ohio.

28 minutes before Survival Flight departed, the emergency department requested a patient transport from MedFlight in Columbus.

The assigned team’s pilot determined that weather conditions were below their program’s weather minimums.

12 minutes before Survival Flight departed, the emergency department issued another request, this one to HealthNet Aeromedical Services, another Survival Flight competitor. The HealthNet pilot declined to complete the flight due to atmospheric conditions that fell below weather minimums.



At 0650, the single-engine, turbine-powered, Bell 407 N191SF collided with forested, rising terrain about four miles northeast of Zaleski, Ohio.

The helicopter's last known location at an altitude of 1,528 ft. msl, traveling at 132 knots on a course of 072°.

The OCS said that about 15 minutes after departure, the helicopter made a turn to the right, then "a sharp left turn," which was immediately followed by a no-tracking alarm.

The wreckage extended about 600 ft. downslope on a heading of about 345°. One main rotor blade had separated from the main rotor hub and was embedded in a tree.

Litter Spins 175 times During Rescue of 74 year-old woman (June 4, 2019 – Phoenix, Arizona)

A 74 year-old woman was flown off Piestewa Peak after she suffered an injury while hiking. During the hoist operation, the rescue aircraft remained in a stationary hover and the rescued woman spun in the basket for roughly a minute before the spinning subsided and the crew safely delivered her to an ambulance. The litter spun 175 times.



In a press conference following the incident. Paul Apolinar (Chief pilot, Phoenix Police Department's Aviation Unit) reported, "Sometimes, when we bring the helicopter up from the ground, [the basket] will start to spin. We have a line attached to the basket that is supposed to prevent that. Today, it didn't." A Fire Department spokesperson also reported, "The potential for the basket to spin is something that's a known phenomenon in the hoist rescue industry, "It's not something that's inherent to the basket or inherent to the bag. It's just something that occurs every now and then and we train to deal with it."

Three months after the incident, ICAR Air Rescue Commission President Charley Shimanski conducted an informal telephone interview with members of the Phoenix Fire Department Special Operations Unit. Shimanski was later told that the agency leadership "would not want any documents or presentations created by another agency regarding this incident."

The 74-year-old hiker was treated for dizziness and nausea. Officials said she was treated at a trauma center and listed in stable condition. According to her husband, "Her eyes were all blackened. Her face was black and blue. Her hands and feet were blue. The nurse said 'the blood went all to her head and broke the small vessels in her face.'"

After this incident was discussed at the ICAR AirCom meetings in Zakopane Poland, a lengthy discussion about dynamic hoist operations ensued.

HEMS Helicopter Crashes at its Airport (June 28, 2019 – Brainerd, Minnesota)

An A-109 helicopter crashed in foggy conditions about 127 miles (204 kilometers) northwest of Minneapolis, Minnesota. Heavy fog existed, but within minimums for an instrument landing.

Paramedic Josh Duda was injured. He later told investigators that the pilot reported foggy conditions on the approach to the airport and that they needed to go around. He then noticed the helicopter spin to the right and hit the ground.



According to the paramedic, the runway surface and lights were visible below a thin fog layer during the approach... He recalled the pilot remarking that the weather conditions were foggy, and they would need to go-around. The main fuselage and tail boom exhibited crushing "consistent with a high velocity vertical descent."

Killed in the accident were Tim McDonald; pilot and Deb Schott; Flight Nurse.

Firefighter Injured by Falling Tree under Rotor Wash (July 31, 2019 – Angelo National Forest, California)

On July 31, 2019, Firefighter Edgardo Garay and his engine crew responded to an incident to render medical aid to an injured hiker.



While the medevac helicopter was preparing to hoist the patient out, it is believed that the helicopter's rotor wash knocked over a dead tree, striking Firefighter Garay and his partner on the head.

Both engine crewmembers were transported to hospital via helicopter. Firefighter Garay was in the hospital's Intensive Care Unit (ICU) and was treated for a subdural hematoma.

OTHER INCIDENTS AND ACCIDENTS

Aircraft Hits World's Longest Zip line (December 29, 2018 – United Arab Emirates)

The Agusta 139 helicopter was on a rescue mission at Jebel Jais, a mountain in the Ras al-Khaimah emirate, when it came down on Saturday. The country's National Search and Rescue Centre said four people had died.

The world's longest zip line opened at Jebel Jais in February 2018. The zip line is 2.83km (1.76 mile-long).

NTSB UPDATES

The following updates from earlier incidents and accidents are worthy of reporting.



Texting contributed to fatal crash according to NTSB (August 26, 2011 – Mosby, Missouri)

The pilot of a medical helicopter that crashed in Missouri in 2011 had been texting, and that was a contributing factor to the disaster that killed four people, the USA National Transportation Safety Board (NTSB) reported.

The case is the first fatal commercial aircraft accident involving texting. The crash was caused by a tired pilot who

skipped preflight safety checks that would have revealed the helicopter was low on fuel. After discovering the fuel problem, the pilot decided to continue on the last leg of the flight anyway.

The pilot exchanged 20 personal text messages... preceding the helicopter crash, according to the NTSB. The helicopter crashed in a field as the craft was approaching an airport where the pilot planned to refuel. The pilot, a nurse, a paramedic and a patient all died.

The pilot missed several opportunities to see that the helicopter was low on fuel before he began the first leg of the mission. The pilot told the communications center that he was low on fuel, estimating he had enough for 45 minutes of flight instead of the 30 minutes he really had.

When the helicopter crashed, there was no fire. Less than one liter of fuel remained in the craft, which lost power due to "fuel exhaustion."



Pilot Used His Cell Phone While in Flight (September 16, 2017 – Lincoln County, New Mexico)

The news helicopter pilot who was killed in the crash had placed a cell phone call to his car rental company during the accident flight. Bob Martin was the only person on board the helicopter when it impacted terrain. He was returning to Albuquerque from Roswell, New Mexico, following an assignment in the area.

Air Rescue Commission Presentations

Detailed below are summaries of presentations delivered to the Air Rescue Commission (or to the joint sessions of Air Rescue Commission and other commissions).

EASA PRESENTATION

By Fabrice Legay

Section Manager - Medium & Light Rotorcraft
European Union Aviation Space Agency (EASA).

For the first time in ICAR Air Rescue Commission history, we were joined by leadership of the European Union Aviation Space Agency (EASA). Mr. Fabrice Legay, Section Manager - Medium & Light Rotorcraft, joined us for the entire AirCom conference sessions, and led more than an hour of presentations.

EASA Hoist Presentation

Mr. Legay started with a recap of a 2013 hoist maintenance flight during which a dummy load was lost due to failure of an overload clutch. Further investigation revealed several issues with some hoists, and an EASA Airworthiness Directive was issued to ensure continued safe operation of the hoist. This initiated a service history review. Mr. Legay shared data dating back to 1950 of hoist fatalities and serious injuries possibly related to hoist design issues. He also shared data regarding occurrence categories, including

1. All occurrences
2. Occurrences with injuries
3. Occurrences with fatalities

The presentation included a detailed description of the four elements of the Airworthiness Directive, [which can be found by clicking here](#).



EASA Human External Cargo (HEC) and Personnel Carrying Device System (PCDS) Presentation

Mr. Legay elaborated on the EASA “Certification Memorandum” (CM-CS-005) published in December 2014. CM-CS-005 principles:



- Definition of “simple PCDS” vs “complex PCDS”
 - The CM addresses simple PCDS only
- Approval of simple PCDS as Minor change
- Reliance on EU standards (EN) for simple PCDS
 - Directive (EC) 89/686/EEC (Personal Protective Equipment) superseded by Regulation (EU) 2016/425
 - Directive (EC) 2006/42/EC (Machinery Directive)

Mr. Legay further described the CS-27/29 2018 amendment pertaining to Complex PCDS.

EASA Air Ops Update Presentation

Mr. Legay also shared Air Operations rule changes that were amended on September 4, 2019. These included:

- NPA 2018-04: Proposed changes for Mountain HEMS – Oxygen
 - HEMS flights at high altitudes with no oxygen
 - Up to 16 000 ft and no more than 30 minutes above 10 000 ft (flight time + time spent on ground)
 - Many conditions apply including hypoxia training for the pilot
 - HEMS flights with oxygen
 - Aligns rules for large helicopters with rules for small helicopters
 - Use of a ‘aviation certified’ oxygen bottle
 - Use of an ‘aviation certified’ dispenser (nasal cannula...)
- NPA 2018-04: Proposed changes for Mountain HEMS with helicopter hoist - HHO
 - HEMS Technical Crew Member (TCM) seating
 - Under certain conditions, HEMS TCM and Hoist TCM could be the same person, seating at the back
 - Crew composition to be the pilot’s decision based on operational conditions
 - Many comments received on both sides... Many were in favour, many wishing the HEMS TCM to be always seated at the front seat at night, in marginal conditions, ...
- NPA 2018-04: Proposed changes for Mountain HEMS with Cargo Sling
 - HEMS HEC: new piece of regulation allowing HEMS with the cargo sling
 - The HEMS TCM could also be the HEC TCM
 - Single pilot – no TCM on board during cargo sling operations
 - Many comments received, again on both sides. Many were in favour, many requesting changes in the HEC TCM training programmes
- NPA 2018-04: Proposed changes for Mountain HEMS – Helicopter performance
 - Allows performance class 3 above 10 000 ft
 - With Category A (twin engine) helicopters only
 - Many comments were received. This topic was very polarised and emotional. Many were in favour of twin engine helicopters, many in favour of single engine helicopters. The discussion led to no clear way forward

VISUAL FLIGHT RULES (VFR) – AIR-TO-AIR COLLISIONS PREVENTION

By Renaud Guillermet

Chief Pilot at the Grenoble France Base of Sécurité Civile,
ICAR Air Rescue Commission Vice President

Several mid-air collisions have taken place under visual flight rules that resulted in numerous fatalities. Mr. Guillermet profiled a few of these accidents. Because of accidents in Europe, FRENCH STATE AIRCRAFT INVESTIGATION BOARD HAS HIGHLIGHTED THE LIMITATIONS OF THE “SEE AND AVOID” PRINCIPLE. In 1991, the Australian Transport Safety Board (ATSB) published a paper “*Limitations of See-and-Avoid Principle*”

“See and avoid” Principle

The “See and Avoid” Principle has been THE solution for years for low-level flights separation. It is very often the only available deconfliction mean for us. Clearly many of us have experience of unexpected mid-air close position. Other situations may have never been detected

“See and avoid” Principle...in 3 steps

- STEP 1: looking outside
- STEP 2: identifying a collision threat
- STEP 3: proceeding to an evasive action

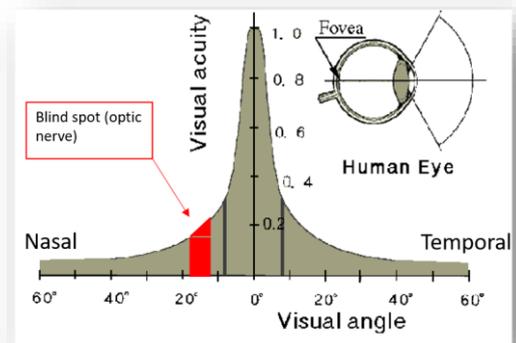
STEP 1: Looking Outside

Mr. Guillermet shared data on the amount of time it takes a human to see, recognize, identify collision track, determine an action, act, and the aircraft lag time. The result is an average of 12.5 seconds.

Some interesting data points were shared about visual acuity:

1. Variation of visual acuity across the retina - in the area of 12-18 degrees visual angle, a blind spot occurs.
2. At twilight, acuity is fairly equal across retina... and bad!
3. As long as a moving object is not locked and tracked, simultaneous actions are impossible.
4. Natural “selective” scanning occurs. Areas of sky near the edges of windscreens are scanned less than the sky in the center.
5. Due to increased workload for airmen, visual field narrows, and eye movements are reduced up to 60%. Hypoxia and adverse thermal conditions also cause visual field narrowing.
6. Individual search effectiveness relies on scanning techniques.
 - a. Moving eyes to scan the sky in retina’s high acuity area.
 - i. Scanning = detect / identify / detect / identify...
 - b. Moving the head to avoid obstructions
7. All individual factors are furthermore affected by fatigue, hypoxia, vibrations, glare

Work organisation in the helicopter, some key points:





- Communication “I am inside / I am outside...”
- Assigning “crossed” scanning sectors
- Use of personal electronic devices PED = mental trap!
- Workload management

Diffusion of responsibility

- No need to say that I am looking at the iPad, other CM are certainly looking outside »

Bug splatters on windscreen and window posts can generate:

- Focal trap : Eyes stay on the natural focus point = 50 cm. –
 - Difficulty to see distant objects.
- Monocular vision:
 - Far less efficient than binocular vision (blind spot, movement detection)

STEP 2: Identifying a collision threat

Danger is converging aircraft...

- Which is the most difficult to see due to lack of relative motion course.
- Human is better at detecting movement!

Target characteristics:

- Aircraft lightings / fluorescent paint only efficient for low flight*
- Aircraft's color less important than contrast with background
- Atmospheric effects: haze, fog scattered light in good visibility!

Effects of complex backgrounds:

- Background contours interact with the form of the aircraft, producing a less distinct image.

STEP 3: Evasive Action

No TCAS (Traffic Collision Avoidance System)

- No coordination of evasive actions
- Growing danger of collision during evasive

When successful to prevent a collision, evasive action could lead to injuries inside the cabin!

Conclusions

See and avoid principle has many limitations:

- Human visual system
- Workload
- Cockpit design
 - A human will never perform a 100% traffic search

The ATSB report was issued on April 1 1991. Since 1991:

- Mission environment has not changed that much
- We still fly VFR in uncontrolled areas
- Human abilities have not changed
- Still no 100% reliable technology available for us:
 - ADS-B: Automatic Dependent Surveillance - Broadcast
 - FLARM: Flight Alarm
 - 100% reliable if 100% of traffic equipped



- No coordinated evasive action instructions
- Air traffic has increased
- Drones popping up

Drones...

- Focus to come very shortly
- Has no eyes (not yet!)
- Far more difficult to spot than manned aircraft
- Most challenging issue for helicopters crews and rulers

ATSB report's recommendations

- Limitations of air spaces where only unalerted see and avoid is the sole mean of separation
- TCAS (ADS-B / FLARM)
- White strobe rather than red
- ~~Pilot~~ **CREW** should be aware of limitations of visual system
- ~~Pilot~~ **CREW** trained in traffic scan
- ~~Pilot~~ **CREW** should not rely entirely on vision to avoid collisions

About ATSB's recommendations –

We could, for example:

1. REC: "Crew aware of limitations of visual system"
 - Refer to ATSB report in initial training course
 - Helicopter crews
 - Rescuers
 - Doctors or paramedics
2. REC: "Crew trained in traffic scan"
 - Train to manage workload (PED, communication...)
 - Insert traffic and obstacle search item in mission briefing "M.E.M.O."
 - Mission
 - Equipment (rescue triangle, Lezard...)
 - My safety devices (transceiver, ...)
 - Obstacles and AIR TO AIR COLLISIONS

NOTE: "MEMO" has significantly increased the number of traffic reported by rescuers.
3. REC: "Crew should not rely entirely on vision to avoid collisions":
 - Use ADS-B And / or FLARM
 - "Be searchable" : use of air to air frequency
 - Coordinate air operations

We fly in areas where:

- "See and avoid" is very often the sole separation mean
- UNALERTED "See and avoid" is our reality
 - Gliders*
 - paragliders
 - drones

"See and avoid" is highly limited

- Remains an important safety system
 - 34 times more collisions if no "see and avoid" and no Air Traffic Service

Our teams must work every day during every mission to improve efficiency of "see and avoid" principle.



DRONES – ASSETS AND HAZARDS

By Will Smith, MD, Paramedic, FAEMS
Teton County SAR

Unmanned Aerial Vehicles (UAV) represent a growing industry and drones are both assets in our SAR world and hazards in our helicopter airspace.

UAV development now includes military, commercial, agriculture, natural resources, and medical (AEDs, blood, snake antivenin, medications, telemedicine, and life safety items)

Deconfliction of search and rescue helicopter airspace is a growing issue as more and more drones are a growing number of drone sightings by manned aircraft.

Dr. Smith presented information about how Teton County Search and Rescue has Established its UAS program for SAR. This included discussion about:

- Certifying (Regulations)
- Training / Equipping
- What UAV is right?
- Concepts for SAR Operations and Deploying for Mission

The FAA regulates UAV's and certifies UAV pilots through Part 107 – (Remote pilot certificate with Small Unmanned Aircraft Systems (UAS).)

Limitations of drones include short battery life, limited flight conditions (Weather, altitude), payload and center of gravity limitations, air space conflicts, and the need for specialized equipment and operators



TEAMWORK IN HEMS

By Jan Bubla
Senior paramedic HEMS Base Ústí nad Labem

HEMS base Ústí nad Labem is the northwest region of the Czech Republic. It is small (130km x 80km) with a population off 800000.

Education required by rescue personnel includes:

- **Pilot** – first aid, medical assistance, CPR, medical equipment,..., CRM
- **M.D.** – HEMS crew member, rescuer (HEC), terrestrial rescue, works in heights communication, safety (high level)
- **Paramedic** – TCM, CRM, rescuer - Terrestrial Rescue, water rescue, board operator, works in heights, PPE check,...
- **Mechanic** - , CRM, board operator, first aid, medical assistance, CPR, medical equipment,...
- **Fire department** – 6 rescuers (HEC), safety, secure landing sites, coop with boat,...
- **Police** - safety, secure landing sites, coop with boat,...
- **Mountain rescue** – 4 rescuers (HEC), safety, secure landing sites, „SAR“, terrestrial rescue, assistance and help in ski resorts,...



What helps?

- Active education, safety rules in simple card, sharing mission data and frequencies, sharing GPS position of person/vehicle (GINA HEMS SW)
- Creation of special meeting/evacuating points deep in forest/rocks.

TEAMWORK IN AIR RESCUE

By Larry Koren, David Lujan, Jason Williams
Albuquerque/Bernalillo County, New Mexico, USA

Since 2013, Bernalillo County's Sheriff and Fire Departments have conducted joint helicopter search and rescue (SAR) missions within the state of New Mexico.

Over the years, Bernalillo County Sheriff and Fire personnel have gained valuable experience saving people from deadly situations using helicopter assets. The Bernalillo county search and rescue efforts have fostered working relationships with many stakeholders



In 2017, the University of New Mexico, Department of Emergency Medicine - International Mountain Medicine Center expressed an interest in participating in a pilot project with Bernalillo County's air rescue efforts. A new dynamic partnership emerged.

The Bernalillo County Sheriff's Office expressed an interest in working with UNM's internationally recognized mountain medicine educational institution known as the International Mountain Medicine Center (IMMC). The IMMC solely focuses its efforts on mountain emergency medicine and rescue through education, research, and clinical practice.

The relationship embodies a pure collaboration aimed at achieving:

1. Rescuing people from austere environments while reducing risks for all rescue stakeholders.
2. Providing collaborative lifesaving training to rescue and medical personnel.
3. Enhancing lifesaving rescue capabilities of BCSO, BCFD, UNM School of Medicine stakeholders, and others.

2018 Pilot Project

- Three-month period during peak SAR season. At hanger staffing
- Addition of UNM paramedic or physician technical rescuer
- Three goals:
 - 1) Increased staffing
 - 2) Collaborative training
 - 3) Financial analysis

Future Educational Program Development

- Alpine Helicopter Rescue Specialty Course (AHEMS) - Diploma in Mountain Medicine Specialty Course
- Collaborative course instruction by UNM, BCSO, and BCFD
- Local, regional, national, and International outreach opportunities



1000 M LONGLINE BODY RECOVERY IN THE TROLL WALL, NORWAY

By Odd Staurset

Norwegian Alpine Rescue Groups

The Troll wall is the highest vertical rock face in Europe, with a total height from the valley floor of 1700 meters. Its vertical face is 1000 m tall. The Troll wall was first climbed in 1965 by a Norwegian team on what is known as the “Norwegian route. A British team established “the Rimmon route” one day later

Two Czech climbers presumably started climbing the Rimmon-route on July 25. They were experienced and have been on the Troll Wall before. They were expected to summit July 27 at the latest. They were reported missing by family on Monday, July 29. Their car was quickly located where expected.

Norwegian Alpine Rescue Group (NARG) personnel soon located a possible finding through binoculars. A helicopter search confirmed the location of two bodies under the Intro wall on July 29, 80 m below the start of the Rimmon route. Position is consistent with falling off close to the Great wall near the Nick-ledges, from approximately 200-300 m height. The climbers were still tied in with several pieces of protection between them. Based on aerial inspection and circumstances, the climbers are presumed dead.

Later analysis: Severe damage to equipment suggests forces caused by rockfall, likely from within the belay chain, ripping out all pieces including an equalized belay station.

Manual evacuation was considered, but would be very dangerous and time consuming

July 30: First attempt

A Super-longline with a 330 Squadron Westland SH-3 Sea King was attempted.

1. Rescuers would ascend 1000 m with rope, and deliver rope and attached equipment near casualties. They would layout the rope down the talus from casualties
2. Rescuers scrambled to the site and packed and placed bodies behind large ice block connected to the longline
3. Sea King picked up 900 m rope in safe zone connected to hoist wire. Expected load was 560 lbs. + wind (the hoist limit was 600 lbs.).
4. Increasing winds caused rope to continuously catch trees, bushes and rocks. It took 2 hours to free the rope. Rescuers were exposed to (and experienced) rockfall over extended period, trying to release rope snags.
5. The attempt was aborted due to deteriorating weather, time and fuel capacity.

Aug. 2: Second attempt

A Longline with Nord Helicopter was attempted (Airbus AS350/ H125)

1. Deliver people at summit and spotter at a nearby summit
2. Deliver equipment at summit and deliver large rope-bag in safe area
3. 1000 m ascent with rope from safe area using wall as reference
4. Deliver weighted rope close to casualties
5. Attach casualties to rope
 - a. Decided not to use previous rope due to risk of snag
6. Tighten rope at summit with Power ascender



7. Pickup rope at summit
8. Fly rope clear of wall and lift casualties
9. Land casualties at safe area and release the 1000 metres of rope
10. Perform an ordinary 40 m longline and deliver the package in valley
11. Total time from start of flying: 6 hours
12. Time from rope pickup at summit until package landed in talus: 15 min.

Teamwork Issues

- Distribution of risk must be fair between partners in order to minimize total risk
 - If one partner insists on no risk, other partners must accept higher risk and thereby total risk might increase
- Written risk assessment helps risk awareness
 - Important for the police if something occurs during the operation
 - Required when standard procedures are deviated
- Need alternative partners with different tools for different tasks
 - Training is essential to perform safe rescues
- Where is the limit of no rescue?
 - Private teams will attempt rescues instead
- Is elegance worth extra risk?
 - It's a highly visible operation at a tourist attraction
- Pull them out/down in harnesses instead of spending time packing?

Conclusions

- First attempt should have been aborted earlier when risks increased due to continuous rope snags
 - It is a typical rescue problem that the situation escalates and risks accumulate. When do we say stop?
- Evacuation beneath the wall is relatively simple compared to evacuation in the wall itself.
 - There is no guarantee that rescues can be performed in the Troll Wall!
- Access to smaller helicopters must be included in the portfolio of NARG-partners.
 - This is not deliverable by existing partners.
 - Requires training (=funding) and procedures for cooperation
- The operation was not beyond the limit of acceptable risk.

ALPINE HELICOPTER RESCUE SPECIALTY COURSE MODULE

By Charley Shimanski

ICAR Air Rescue Commission President

The medical commissions (MedCom) of UIAA and ICAR, together with the International Society for Mountain Medicine (ISMM) established minimal requirements for a formal Diploma course in August 1997. Many course organizers adopted these standards and the resulting *Diploma in Mountain Medicine (DiMM)* has become a widely respected qualification.

Additional training DiMM module components for the DiMM include helicopter rescue. The curriculum for this module was developed by medical and helicopter rescue specialists worldwide.



DiMM Course Approval

Organisers of mountain medicine courses worldwide can apply to endorse their courses with the label of *Diploma in Mountain Medicine* by an application. A “DiMM Regulation and Assessment Committee” reviews the application. The course may be approved, rejected with reason(s) or referred to the UIAA and ICAR MedComs and the ISMM. New courses are approved for 2 years. New course organizers must invite members of the UIAA MedCom, ICAR MedCom or ISMM to observe their courses.

Qualifications/Requirements for Students

The DiMM qualification can only be awarded to Health Care Professionals registered with a national professional regulatory body (Physicians, Paramedics, Nurses, etc.). The Diploma in Mountain Medicine cannot be awarded to basic life support personnel (EMTs, First Responders, First Aid, etc.).

Specialty Helicopter Course

Specialty Rescue Courses are designed for Health Care Professionals who are (or are becoming) members of an organized rescue service, and have been trained in Advanced Life Support (ALS).

The specialty courses include ***Alpine Helicopter Rescue Specialty Course Module*** focuses on air rescue operations in mountainous terrain and should at least attain the minimum standards and regulations of the region or nation.

Alpine Helicopter Rescue Specialty Course Module (AHEMS & Alpine Flight Crew Emergency Survival Training AFCEST)

The Alpine Helicopter Rescue Specialty Course Module is a 54-hour module that is intended to support the work of health care professionals who are part of an alpine helicopter emergency medical team.

The ICAR AirCom leadership has identified an opportunity to become engaged in the AHEMS/AFCEST modules, to ensure oversight and endorsement. AHEMS is a valuable new addition, and ICAR AirCom and other stakeholder collaboration is key.

Recommendation for AirCom

The Recommendation to the ICAR AirCom was that ICAR AirCom should review and advise the DiMM organizers on the components related to helicopter rescue in the alpine environment. The AirCom should:

- Review the components of the current curriculum
- Determine if there should be requirements for program instructors
- Determine if the DiMM Regulation and Assessment Committee should include a member of ICAR AirCom
- Determine ICAR AirCom should offer site assessors for the AHEMS module

The ICAR AirCom delegates in Zakopane agreed that the DiMM AHEMS Specialty Module would be enhanced by ICAR AirCom involvement in the program.

EMOTIONAL RESCUE/PSYCHOLOGICAL FIRST AID

By Alison Sheets, MD

Vice President, ICAR Medical Commission
Rocky Mountain Rescue Group; Boulder, Colorado, USA



Epidemiology-

- Suicide statistics- first responders (law, fire, ems) with twice the rate of suicide as the general population
- Suicide is now recognized as the leading occupational killer of emergency responders
- Stress injury and PTSD in first responders
 - Canadian study found high rates of PTSD (24.5%), depression (29.6%) and panic disorder (10.3%) among paramedics.
 - First responders develop these conditions much more than the general population.
- Most people will feel the effects of a stressful event- this is normal
 - Elevated heart rate
 - Tunnel vision
 - Poor memory formation
- Repeated exposure and particular types of exposure tend to be more impactful.
 - Known victims, teammates
 - Children, fatalities
 - Resources overwhelmed, poor leadership, unclear mission
 - Danger, environmental hazards
 - Rescuer tired, emotionally drained, injured
- When stress response continues, **physical** (neurohormonal) changes occur
 - Increased cortisol
 - Startle response, flashbacks
 - Anxiety
- Longer term symptoms can lead to PTSD
 - Panic
 - withdrawal from social interactions
 - depression, suicidality

How do we as rescuers prepare ourselves and our teammates?

- How do we recognize “operational readiness”?
- How do we deal with the stress injured rescuer or patient?
- When do we need to get professional help?
- Does anything really work?

The 5 principles of emotional rescue (Psychological or stress first aid)

- **Safety**- remove from danger, confirm physical safety.
- **Calm**- reduce stimuli, breathing techniques, visual separation
- **Self-efficacy**- help patient re-establish control, give task
- **Connection**- involve other team members, friends, family
- **Hope**- plan for future, follow up/check in, provide mental health resources



Many teams are incorporating emotional rescue into normal daily operations

- Normalize the language and conversation around stress injuries
- Foster connection and build resilience
- Practice psychological first aid in the field
- De-escalate after stressful missions
- Check in later, call 2-3 days out
- Ask at startup of next mission, opt out option
- Have referral to professional care in place

Do interventions work? When to get professionals involved?

- Calm, safety, self-efficacy, connection and hope within the team are helpful at any stage and good support systems best predictor of recovery
- Critical incident stress debrief (CISD)- can help but **can harm**
- Cognitive behavioral therapy (CBT)- helps for stress injury, PTSD
- Eye Movement Desensitization and Reprocessing (EMDR)- effective for PTSD



Mountain Rescue Stress Continuum

2020 ICAR Congress

The 2020 ICAR Congress will be held October 13-18, 2020 in Thessaloniki, Greece. It will be hosted/organized by HRT Hellenic Rescue Team. The theme will be **"Risk Assessment in Mountain Rescue Operations."** For More, [CLICK HERE](#)...

The Agenda is as follows:

- Tue 13 Oct > Arrival
- **Wed 14 Oct > Practical Day**
- **Thu 15 Oct > Congress**
- **Fri 16 Oct > Congress**
- **Sat 17 Oct > Congress (incl. ICAR Assembly of Delegates)**
- Sun 18 Oct > Departure Tue 08 Oct 19 > Arrival

More event and registration information will be published in Spring 2020. For More Information

- [HRT Website \(external link\)](#)
- [ICAR 2020 Convention / Call for Papers](#)
- [ICAR 2020 Greece Promo Video \(external link\)](#)
- [Thessaloniki Convention Bureau \(external link\)](#)
- [Thessaloniki Destination Video \(external link\)](#)
- [Thessaloniki Region Guide \(external link\)](#)

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