

International Commission for Alpine Rescue



REPORT OF THE ICAR AIR RESCUE COMMISSION

International Commission for Alpine Rescue (ICAR)

October 12-15, 2022

Montreux, Switzerland

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Introduction

The International Committee for Alpine Rescue (ICAR) Congress was held in Montreux, Switzerland on 10-14 October 2022. The Congress was hosted by Alpine Rescue Switzerland and their local teams in the Montreux Region. Overall, the Air Rescue Commission (AirCom) had 96 members and guests (while 132 registered for TerCom, 79 for AvaCom, 76 for MedCom)





In all, AirCom representatives came from 67 agencies and 27 countries. 54 of the AirCom representatives came from 32 ICAR Membership Organizations.



2022 marked the 74th anniversary of ICAR, and the Congress was a successful event, particularly because we were finally able to meet in person again after two years of virtual Congress events due to COVID. The Congress represented an exciting opportunity to share techniques and discuss how to improve the safety of mountain rescue personnel. A near-record number of participants - pilots, rescuers, technicians, and medics - took part in the Air Rescue Commission sessions.

With a theme of "The Future of Mountain Search and Rescue - new strategies for operating and management of Mountain Search and Rescue Operations", the Congress started with a full day of practical workshops in the hills high above Montreux and continued with three

days of seminars inside the Montreux Music and Convention Centre ("2M2C"). Four rescue helicopters from three different agencies participated in rescue demonstrations during the Congress.

Air Rescue Commission program

This year, 96 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, Incidents, and Prevention
 Air Rescue Commission leadership
 Charley Shimanski and Renaud
 Guillermet
- SAFETY: Flying Helicopters Without Leaving the Ground; VRM Switzerland / Fabi Riesen
- Considerations for HEMS Programs Operating in the Vicinity of Paragliders and BASE Jumpers – Charley Shimanski and Renaud Guillermet
- Aviation Leadership Needs, Wants and Attitudes; Terry Miyauchi
- European Safety Promotion Network-Rotorcraft (ESPN-R) Working Group update; Alexander Weissenboeck and Bernd Osswald
- Dynamic Hoist Profiles for Passive and Actively Controlled Litter Systems; Colorado National Guard / Clayton Horney
- Safety Improvements HHO; DRF Luftrettung / Sebastian Schneider and Jörg Redetzky
- European Aviation Safety Agency (EASA) Update; EASA / Fabrice Legay





- Interdisciplinary Drone Workgroup; An EASA Update
- Cell Phone Tracking; SAGF / Lt. Col. Alessandro Alberioli and LIFESEEKER / Héctor Estévez
- Load Stability System Live Demonstration; Vita Inclinata / Caleb Carr
- Risk Management Workshop; Sécurité Civile / Renaud Guillermet
- Pre-Incident Planning Major Incident Response Emerging Methods for Taking Care of Our Own; Responder Alliance / Laura McGladrey
- Is Oxygen Supply Needed in Providers Operating in Helicopters While Exposed to Hypobaric Hypoxia?; Eurac Research / Giacomo Strapazzon
- Unique Lessons From Air Force Pararescue Teams; US Air Force / Travis Shaw
- Rescue and Recovery at Active Volcanoes: an Aviation Perspective Including Key Prompts for Operational Planning; LandSAR NZ / Nico Fournier Accidents and incidents in 2018 and 2019
- Managing Increased SAR Stress McGladrey/Responder Alliance
- The Past, Present and Future of Mountain Rescue Gerold Biner/Air Zermatt

The week was full of events at both the 2M2C and local venues that highlighted the beautiful region of Montreux

- On Wednesday morning, registrants for the October 12 "Practical Day" traveled by train from Montreux to Col de Jaman where we engaged in a Practical Workshop Day.
- Wednesday evening included an Opening reception at the 2M2C.
- On Thursday and Friday, October 13-14, we were at the Montreux Music and Convention Center (2M2C) for Commission meetings, discussions, and working sessions with coffee breaks and discussions with exhibitors.
- On the evening of Friday October 14, we traveled by bus to a nearby village for an exciting Local Event & Dinner, complete with great local demonstrations.
- On Saturday, October 15, we were again at the 2M2C for joint sessions of meetings, discussions, and working sessions with coffee breaks and discussions with exhibitors. We concluded the afternoon with the annual Assembly of Delegates.
- On the evening of Saturday, October 15, we wrapped up our event with our Annual ICAR Gala Dinner – an event that took place at the beautiful World Cycling Centre.

Attendance by Three Helicopter Rescue Programs

The ICAR Congress also included special onsite presentations of helicopters and rescue programs representing Air Zermatt, Rega, and Swiss Helicopters. In addition, Rega performed a demonstration of their specialized SAR drone.

Special Presentations by the European Aviation Safety Agency (EASA)

Fabrice Legay, Section Manager - Medium & Light Rotorcraft for EASA (European Aviation Safety Agency), again attended the ICAR AirCom meetings, and led two significant presentations on activities at EASA pertaining to rotorcraft and drones. The collaboration between EASA and the ICAR Air Rescue Commission (AirCom) continues to be 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.



Air Zermatt attended the Practical Day and its team performed with precision a demonstration of the RECCO SAR Helicopter Detector, finding two "lost" subjects who were hidden deep in trees. The Air Zermatt team found both subjects in just a matter of minutes.

At the Practical Workshop site, Rega flew in their AW109 search helicopter, a dedicated helicopter equipped with a thermal camera and a mobile phone locator. Another crew flew in the Rega H145 aircraft. Rega conducted sessions on the specialized equipment and staffing of these rescue helicopters.

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 File Availability

In addition to this written narrative summary of the Air Rescue Commission proceedings, AirCom delegates and guests at the Congress also receive separate access to the AirCom presentations so that they can share some of their learnings with their member agencies. The PowerPoint and other electronic presentations are made available to AirCom attendees for download.





2022 Summary of Presentations

Air Rescue Commission Presentations

Detailed below are summaries of the Air Rescue Commission presentations delivered during the 2022 Congress.

Accidents, Incidents, and Prevention – Air Rescue Commission Vice President Renaud Guillermet

AirCom Vice President Renaud Guillermet led an informative review of helicopter rescue accidents and incidents in France, including a profile of accidents in the last 12 years. One accident in particular took place in good weather and in conditions with no specific obstacles. In the rescue, the pilot was focused on paragliders that were flying in the area when he arrived on scene. The pilot was not focusing on crewmembers, and lost situational awareness, resulting in a controlled flight into terrain. One key factor was that the pilot did not control his airspeed correctly.



Renaud also profiled an inadvertent HEC incident in which one rescuer was lifted off the ground with the litter. Due to their proper HEC lift safety procedures, a second rescuer immediately requested a stop to the hoisting and the litter was lowered safely back to the ground. There was no harm done in this incident.

Renaud completed his presentation with a very informative summary of accidents over the 2012-2022 period, based on the French BEA (civilian aircraft board of investigation). He reported on 33 SAR/HEMS (mountain) events worldwide, especially noting the high percentage of CFIT accidents.

SAFETY: Flying Helicopters Without Leaving the Ground; VRM Switzerland / Fabi Riesen

Fabi Riesen of VRM Switzerland delivered a presentation on how virtual reality (VR) flight simulators can increase safety in helicopter rescue programs without having to dedicate helicopter time. This increases training opportunities, reduces costs, and reduces the risk of aviation accidents.

He mentioned that hoist operator training is now possible in the virtual reality world, and with this new element, programs can also combine the pilot simulation and the hoist operator simulation into one virtual reality experience.

Another advantage to VR flight simulation is that the simulation managers can then work with the student to analyze the flight in a recorded replay.





Considerations for HEMS Programs Operating in the Vicinity of Paragliders and BASE Jumpers – Charley Shimanski and Renaud Guillermet

Renaud Guillermet (France), Dan Halvorsen (Norway), Øyvind Henningsen (USA), and Mike Koppang (Canada) each delivered a 5-minute presentation on their rescue programs' response to accidents involving paragliders and BASE jumpers.

Renaud mentioned that in France, they often have to cross "a cloud of paragliders" during rescue operations. They developed a valuable infographic, which they distributed to paraglider clubs so that they could have suggestions and instructions for operating in areas where rescue helicopters also fly. They also put up billboards at some of the most famous paragliding sites. When they are about to fly in a rescue mission, they also make a radio call on the paragliding frequency, and overfly the take-off platform of paragliders, so that they know the helicopter is in the area. The helicopter announces the beginning and end of the mission. Renaud also added tips for ground-based rescues of the paragliders, including:

- Safety: the wing must be secured
- The rescue mission can be very long, often into the night
- They use a special Petzl L54 LIFT for rescues, which attaches to the paraglider suits

Dan Halvorsen (Norway) reviewed some data on incidents and accidents in Norway. Norway has experienced roughly 10% of Paraglider/Base Jumper accidents worldwide. Recommendations from Norway for rescue of paragliders include:

- Do a recon flight (keep a safe distance from the parachute)
- Deploy rescuers into the area but at a safe distance from the victim
- Secure the victim
- Wrap the parachute
- THEN evacuate

Øyvind Henningsen (Washington/USA) noted that in the USA, paragliding in most areas is not legal. This makes it difficult to establish communication with the jumping community. Lessons they have learned in rescues of paragliders include:

- Slow down make a plan
- Assess if the subject is dead or alive
- Make sure the subject is secure
- Determine a safe insertion point usually inserting personnel above and to the side of the parachutist. Determine how far away you need to be in order to not re-inflate the parachute
- The accident sites are generally remote and unmarked on maps
- They carry extra gear such as knives for cutting chords and rope rescue gear

Mike Koppang (Alberta Parks/Canada) noted that they are in their infancy as paragliders and base jumpers are only now becoming more abundant. Paragliding is legal on Crown land outside of the park, but illegal in the national park areas. Wingsuit and paragliding are the main activities, and it is a bit of an underground activity, so they do not want to tell the regulators what they are doing.





From a proactive perspective, they are working with Hang Gliding and Paragliding Association of Canada to be able to communicate with the pilots on a specific frequency. The jumping pilots will often make an all-call on specific days, or have the pilots call the base to tell them when they are jumping (legal or illegal)

Aviation Leadership - Needs, Wants and Attitudes; Terry Miyauchi

Based on his decades of experience, including as Aviation Commander at Arizona Department of Public Safety, Terry Miyauchi gave a non-traditional leadership presentation that utilized real-world stories as a means of enhancing operational effectiveness and safety. It included a unique focus on the criticalness of identifying and empowering individual needs, wants and attitudes while noting that how we live and work across our teams and boundaries is more important than any equipment and technology that we have in aviation.

European Safety Promotion Network-Rotorcraft (ESPN-R) Working Group update; Alexander Weissenboeck and Bernd Osswald

Alexander Weissenboeck and Bernd Osswald (from Airbus Helicopters) gave a European Safety Promotion Network-Rotorcraft (ESPN-R) Working Group update.



ESPN-R is a collaboration of subject matter experts who are voluntarily operating in specific topics. They bring their knowledge into groups and try to disseminate best practices. ESPN-R is now heavy on the outreach, and does not want this to be just a European program.

The key ESPN-R stakeholders (among others) are:

- VAST (Vertical Aviation Safety Team)
- European Helicopter Association (EHA)
- EASA
- Airbus
- Leonardo
- Helicopter Association International (HAI)

Bernd and Alex described the five teams and task forces within ESPN-R

- Team Training
- Team Ops & SMS
- Team Technology
- Task Force Hoist Safety Promotion
- Task Force Sling Load Safety Promotion

In 2021, ESPN-R issued a hoist operator training guide. There is also a Pilot Guide and PCDS Guide, and more guides are forthcoming. They also mentioned the ESPN-R LinkedIn site, with over 3,000 members, at https://www.linkedin.com/groups/8693588/

A brief overview of history in hoisting operations and operational best practices for hoist operations were shared and presented by the ESPN-R Hoist Safety Promotion task force leader Alexander Weissenböck.





Dynamic Hoist Profiles for Passive and Actively Controlled Litter Systems; Colorado National Guard / Clayton Horney

CW3 Clayton Horney of the Colorado (USA) Army National Guard is leader of the Colorado Hoist Rescue Team (CHRT). In his highly rated presentation, he highlighted the effort the CHRT program has undertaken to transition to dynamic hoist from a more traditional tag-line hoist operation. By doing so, the Colorado unit has advanced what the entire United States Army is doing.

Clayton and his team developed testing data using real flights and a litter with a weighted dummy. They evaluated airspeed and altitude, distance and hoist length. The data diagrams are quite revealing, as shown in his presentation. They determined that rotor downwash velocity is related to aircraft weight, rotor area, and air density, reaffirming that maximum rotor velocity (spin) occurs at 1.5-2 x the rotor diameter below the aircraft.

Safety Improvements - HHO; DRF Luftrettung / Sebastian Schneider and Jörg Redetzky

One of the most popular programs was delivered by Sebastian Schneider and Jörg Redetzky of DRF Luftrettung. In their presentation, they summarized key elements of HHO Training, with a specific focus on the decision-making process (having a plan A and plan B as backup).

Jörg and Sebastian highlighted some of DRF Luftrettung emergency procedures using a BK 117 D-2. They included examples of losing an engine, and whether the pilot and crew have the option to fly away. What do we do with the HEC in case of engine failure during hoisting? Reel down? Reel up? DRF implemented the "continue" procedure as a procedure call by the HHO-TC so that everyone knows on board what to do. The decision depends on performance of the



helicopter, environment (altitude, etc.), and hoist speed. They also discussed their new virtual reality program, which includes hoist operators flying in parallel with pilots in a VR setting.

European Aviation Safety Agency (EASA) Update; EASA / Fabrice Legay

Fabrice Legay, the European Union Aviation Safety Agency (EASA) Section Manager - Medium & Light Rotorcraft, again delivered an update on rotorcraft issues at EASA. He discussed in detail:

- the European Technical Standard Order for hoist.
- Personnel-Carrying Device Systems (PCDS) Focus on rappelling and fast-roping in the EASA system
- CS 27/29 update
- Certification Memoranda (Rotorcraft)
- Rotorcraft Safety Roadmap
- HEMS update
- · Opt-in for state operations / aircraft

The detail was important for our participants, but far too extensive to be effectively summarized in this report.





Cell Phone Tracking Systems; SAGF / Lt. Col. Alessandro Alberioli and LIFESEEKER / Héctor Estévez

The SAGF and Centum each delivered engaging presentations highlighting the value of technology that can assist SAR teams in locating lost subjects by locating their cell phones. Essentially, the tools are flying cell towers that can isolate with great accuracy the location of a phone. The Centum technology is available for operation from a specialized drone as well.

Guardia di Finanza profiled delivered a presentation that concerns technology called "IMSI/IMEI catcher." This is capable of "replacing" a BTS (Base Transceiver Station) in order to geo-locate the phone of the missing person. This system is installed on board of helicopters and is used by the rescue crew (normally consisting of pilot, winch operator and helicopter rescue technician). The use of this technology makes it possible to greatly narrow the search range and speed up the time of intervention.

CENTUM's Lifeseeker is helping SAR organizations to save more lives every day by finding missing people through their mobile phones in a matter of minutes and in all network conditions. With more than 25 successful missions in the second half of 2021 and over 20 end users already operating the system around the world, this product has become a powerful tool that maximizes the success of search missions.

In their presentation, Centum focused on the Lifeseeker operation in real missions, so we will analyze some Lifeseeker's success cases from operator's point of view. We will see the main benefits for the SAR mission using this technology and how the geolocation is performed in the Lifeseeker interface until the missing person is located and the mission is solved.

Load Stability System Live Demonstration; Vita Inclinata / Caleb Carr

Vita Inclinata CEO Caleb Carr noted that their Vita Rescue System- Litter Attachment (VRS-LA) enables mountain rescue crews greater speed, safety, and control while conducting hoist operations. Mountain rescue teams no longer need to rely on time consuming tagline procedures or be worried about high winds, rotor wash and other environmental factors. By eliminating taglines, aircrews can complete missions in wooded and steep terrain up to 4 times faster; and, by giving the hoist operator complete control of the rescue device, the need to conduct a dynamic hoisting in constrained terrain is eliminated.

Pre-Incident Planning - Major Incident Response - Emerging Methods for Taking Care of Our Own; Responder Alliance / Laura McGladrey

Laura McGladrey delivered an important presentation on an emerging area in psychological First Aid - namely developing action plans PRIOR to a major incident involving one of our rescue personnel. She noted that we must advance beyond the historical Incident support where we respond reactively after an event has occurred that affects our team. The new direction is a proactive model wherein we develop tools and techniques in advance so that we can move quickly to implementing an action plan immediately after the incident.



Laura noted that the goal of Major Incident Planning is to reduce the novelty and trauma impact



of an incident that affects the rescue team, noting, "The start of a crisis is a terrible time to do crisis management planning." Rescue agencies are encouraged to visit www.responderalliance.com for more information on stress injuries.

Risk Management Workshop; Sécurité Civile / Renaud Guillermet

Renaud Guillermet delivered an engaging presentation on risk management that was far more *discussion* than presentation. In this session, Renaud framed the conversation around a rescue agency that was trying to determine an operational strategy to reduce the risk of a Controlled Flight Into Terrain (CFIT) accident. He engaged the AirCom participants in problem solving by starting with "asking questions…," noting that it is important to first gather information and assess a situation before proposing solutions. In the end, the participants had developed enough information to begin the next step of developing a framework for solutions.

Interdisciplinary Drone Workgroup; An EASA Update

Fabrice Legay is the European Union Aviation Safety Agency (EASA) Section Manager - Medium & Light Rotorcraft. He delivered a presentation on Drones and Manned Aircraft in U-space during which he described U-Space as a set of "inew services' and 'specific procedures' designed to support safe, efficient and secure access to airspace for large numbers of drones without airspace segregation. Mr. Legay further defined it as "Geographical zone designated by the Member State on the basis of a risk assessment and considering safety, security, environment and privacy." He shared the EASA "High Level Roadmap" of iConspicuity for Rotorcraft and General Aviation

Is Oxygen Supply Needed in Providers Operating in Helicopters While Exposed to Hypobaric Hypoxia? Eurac Research / Giacomo Strapazzon

Dr. Strapazzon delivered a presentation highlighting the research that has been performed on the impact of reduced oxygen concentration on helicopter pilots and crewmembers. He noted that we all know that density of the oxygen decreases as altitude increase, but studies have never been done on helicopters that are not pressurized and gain altitude fast. EASA has shared the limitations and equipment requirements for HEMS operations.

Dr. Strapazzon noted that not all the cognitive domains are effected in the same ways by increases in altitude. In particular, attention and reaction time are impacted. Their goal is to evaluate the effects of acute exposure with rapid ascent.

In their tests, they assessed several cognitive domains in their 48 participants. Their results, soon to be published, included slower reaction time, while also noting that there was no independent effect of altitude on the number of correct and incorrect responses to the problems presented on the iPads.

Interdisciplinary Drone Workgroup; A Workgroup Update

Members of the ICAR Interdisciplinary Drone Workgroup (IDWG) delivered a presentation on the work of the IDWG, and elements of drones as both assets and hazards in SAR.

Starting with the history of drones, the IDWG members spoke to the issue of drones as a hazard. They noted that the biggest problem is the usage of airspace. "U space" and some countries have national policies that can address this growth. Avoiding midair collisions is the key, and is important to deconflicting airspace

Presenters briefly discussed drones in avalanche rescues. Drones could someday fly over the avalanche and conduct a course search, marking the point of the located transceiver.



There was also a mention of using drones to fly in medical equipment. These have been used to save patients from cardiac arrest, or delivering AEDs to patients in an urban or even rural setting.

Unique Lessons From Air Force Pararescue Teams; US Air Force / Travis Shaw

US Air Force Pararescue leader Travis Shaw described the program he works in and how that relates to mountain rescue in austere environments. Shaw described how they had to look carefully at all their equipment and make decisions on what equipment is most valuable. He also described how using fixed crews improves processes... in other words, using the same people on organized crews day in and day out.

Travis Shaw concluded with his thoughts on the need for psychological first aid for rescuers who are exposed to difficult situations, such as remains recovery. Horrific accidents cause a toll on teams. He discussed how the sights and smells that go along with these incidents are real, and the importance of preparing a team for when they see something difficult for the first time.

Rescue and Recovery at Active Volcanoes: an Aviation Perspective Including Key Prompts for Operational Planning; LandSAR NZ / Nico Fournier Accidents and incidents in 2018 and 2019

Mr. Fournier delivered a high-level presentation on the kind of things to think about when providing aerial search and rescue around active volcanoes, primarily in areas with reduced air quality. He noted that post-eruption ash accumulations on a helicopter can be dangerous, and that operators should use very high quality filters. He further noted,

- During eruption the presence of ash in the atmosphere is something to really consider
- When a volcano is erupting you have a dense ash plume
- Top part of plume is white (mostly steam with traces of ash_
- Bottom part is dense
- Presence of ash in the air for days or months
- Gas and ash can be transported downwind as far as 10-100 kms away
 - Immediate safety
 - Engine failure
 - Blockage of sensors, erroneous airspeed indicators and warnings
 - Impact on an opaque windscreen
 - Contamination of cabin air (gas/ash mask)
 - Longer term
 - Corrosion and abrasion of external aircraft components
 - Contaminated ventilation
- In a nut shell engines don't like ash

Managing Increased SAR Stress - McGladrey/Responder Alliance

Many rescue agencies worldwide are experiencing an unprecedented number of rescues and are experiencing unusual patterns of behavior in those they rescue, increasing operational stress and exposure to traumatic stress. Laura McGladrey's plenary session presented an overview of trends in rescue utilization, as well as operational tools and procedures utilized by rescue teams in the United States in response to increasing stress and traumatic exposure. She described methods involving planning, recognition and mitigation for both traumatic and operational stress that impact rescue professionals and teams.



The Past, Present and Future of Mountain Rescue - Gerold Biner/Air Zermatt

We were privileged to have a presentation by ICAR Past President Gerold Biner. Gerold is a legendary rescue pilot and the CEO of Air Zermatt. His impressive resume includes over 15,000 hours of mountain flying and 5,000 successful rescue missions.

In his presentation, Gerold highlighted the early days of mountain rescue, going back as far as the 1930s. He profiled advances that took place in mountain rescue in each decade since 1930.

Gerold then delivered a thorough assessment of the modern-day mountain rescue environment, focusing on advances in search and rescue technology. He wrapped up an engaging, and humorous presentation with his projections for the future of mountain rescue. His closing comments included his perception of the future of SAR, with a particular focus on possible technology advances.

2023 ICAR Congress

The 2023 ICAR Congress will be held 17 Oct - 22 Oct 2023 in Toblach, Südtirol, Italy at the Euregio Cultural Center Toblachin. It will be hosted/organized by AVS South Tyrol Mountain Rescue.

Local web site is here: https://www.bergrettung.it

The Agenda is as follows:

- Tue 17 Oct > Arrival
- Wed 18 Oct > Practical Day
- Thu 19 Oct > Congress
- Fri 20 Oct > Congress
- Sat 21 Oct > Congress (incl. ICAR Assembly of Delegates)
- Sun 22 Oct > Departure

More event and registration information will be published in Spring 2023.

For further information regarding this report, contact:

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