International Commission for Alpine Rescue

Minutes of the Presentations in the Terrestrial Rescue Commission

Location:	Montreux, Schweiz
Date:	13. Oktober 2022
Time:	09:30
Present:	Delegates of the Terrestrial Rescue Commission
	Delegates of the Terrestrial Rescue Commission, Avalanche Commission and Medical Commission from 10:30 to 11:00
	Delegates of the Terrestrial Rescue Commission and Avalanche Commission from 11:00 to 11:30 and 16:00 to 17:00
Head:	Gebhard Barbisch, Kirk Mauthner
Minutes:	Fabienne Jelk

Report on a Rescue Operation from Furggbach KWRO / Anjan Truffer

The accident happened on 01 May 2022. Two skiers were skiing across the Furggletscher coming from Italy at around 10:30 am. At that time, the snow was already very soft due to the prevailing temperatures. One skier broke through the snow cover at an altitude of about 2600 m.a.s.l. at the point where the slope goes steeply towards Furgg. He was pulled under the snow surface by the flowing water.

The second skier alerted the rescue team with emergency call 144 at 10:45 a.m. 5 rescue specialists and a dog handler were immediately flown to the accident site. The dog immediately started the search. We could see that this search could be successfull due to the steepness of the terrain and the danger of collapse of the snow cover. Due to the danger of the snowpack collapsing, the tripod was also not used and various anchor points were set on the rock above the accident site. Searching with RECCO and avalanche beacon was not practical because the skiers were not equipped with either a RECCO transponder or an avalanche beacon. The search was started with avalanche probes. This proved difficult

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because a layer of ice was formed by the flowing water. Therefore, a chain saw was requested from Air Zermatt to cut the ice. The plan to clear the entire canal from the collapse site was also rejected. This could have covered the missing person with snow and thus endangered him.

Finally, a rescuer was able to capture the skier about 10 meters below the collapse site with an avalanche probe. They immediately began to dig a hole. However, the victim was much further down than hoped. The creek dropped steeply there and there were 7 meters missing to the victim. The water had a temperature of 4 degrees. The man was still alive. We lowered a rope to him so he could hook up, but he was not wearing a harness. The man tried unsuccessfully to pull himself up by the rope. He was then lowered a rescue harness, but the victim was unable to put it on. Rescuers noticed the man was getting weaker. A rescue diver was requested, which was ready at 12:03 in Raron.

Time was pressing and they could not wait for the diver. So at 11:50 a.m., a rescuer, Thomas Zumtaugwald, prepared to go into the cold water and get the man. For the rescuer it was an extreme experience. He described it as follows:

«I looked around to find that my colleagues were all somehow busy or roped up and couldn't get away. That's when I decided to descend into the hole and get the unfortunate guy out. It was necessary that we had to do something, as we were afraid that if we waited for the diver now, we might suddenly be too late after all that effort. As soon as I was in the hole, it immediately became dark and I could not see the patient. The water was extremely cold and I was soaked within seconds. When I held my head very close to the rock face, I could see the man a few meters below me and I memorized his position. He was lying at the bottom of the heel on the ground, the water ran over his whole body, only he could hold his head out of the water in a sideways position. Virtually flying blind, I put the triangular device on him, fastened the rope and gave the command to pull. Since the opening was too small to accompany the patient, I had to wait until my colleagues had pulled the man out of the hole. At that moment, I was afraid I would not get out of that hole alive! »

The man could be taken out at 12:16. He was unconscious, his core body temperature was still 23 degrees. He was taken to Inselspital and recovered well.

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He could not remember anything afterwards, but did not miss the opportunity to invite all those involved in the rescue operation to a celebration in Cervinia. This was an unforgettable experience for everyone.

Takeaways:
Teamwork and technical knowledge are essential. It is always very satisfying when a rescue operation ends well and everyone goes home alive, but there is a fine line between success and failure with a potentially fatal outcome. The question is always, how much risk do we want to take? We must remain modest and objectively assess the situation with a good riskmanagement.

Questions/Comments:

Alistair Read: Was personal equipment available for such actions in the water?

Anjan Truffer: The rescue station has equipment for canyoning, but there was no time to get it at the base and equip with it. That's why they called in the diver, but time ran out, so the rescuer decided to go into the water himself.

Presentation-File: 20221013-02-Furggbach-KWRO.mp4

Selected Avalanche Cases, Mathieu Pasquier (CHUV) & Study of cause of death in Spanish Avalanches, Iñigo Soteras, (HDC) & David Rovira UIM-PGME TERCOM/AVACOM/MEDCOM Joint Session

David Rovira, Iñigo Soteras:
Show a study on the cause of death in avalanches in the Pyrenees. For a long time, due to the snow conditions (dense and hard) and the type of avalanches (mostly snow slab avalanches) in the Pyrenees, it was assumed that most deaths in avalanches were of traumatic origin. However, there were no studies on this. It was therefore decided to analyze deaths from 1970 to 2020 in the Mountain Mortality Observatory study. During this period, there were 59 fatalities in 45 events. To analyze the cause of death in these avalanches, one needed the autopsy reports of the deceased, which were made in these years. These were collected in the various courts.

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The following data were collected: Gender, age, activity during the accident, type of avalanche, cause of death (suffocation, trauma, hypothermia), type of injuries (location, severity), avalanche beacon present or not, type of burial.

The study showed that the main cause of death in the avalanches was suffocation. All of these victims were completely buried. The question was whether they would have survived if they had been partially buried or could have been found more quickly. Solutions: Improve training in companion rescue, establish international avalanche protocols, appropriate safety equipment.

Only 51.7 percent of victims had an avalanche beacon.
Solution: Make current knowledge known to the general public, training.

More than half of the asphyxiation victims died in a snow slab avalanche.
Solution: improve local snow monitoring, more studies needed.

More than 50 percent of those who died from trauma had head injuries.
Solution: prevention in relation to head injuries.

Abstract: Asphyxiation was the main cause of death in avalanches in the Pyrenees. The results of this local study are consistent with other data previously reported from different countries. Thus, have are now available scientific evidence that guide and training may be similar.

Dr. Mathieu Pasquier: presents various cases.

First case<.
Buried less than 60 minutes. The lucky asphyxic.
A person completely buried. Mouth filled with snow. He was recovered by the snow patrollers and could be made to breathe again. The important thing with this victim was that he was found quickly.

Second case<.
Spilled for more than 60 minutes. The unlucky hypothermic.

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Third case:
Less/equal 60 minutes spilled. The unlucky asphycix. CPR during more than 40 minutes. After 36 hours, the victim died.

Fourth case:
Buried for more than 60 minutes, victim was dead.

Victims with short burial times are more likely to survive. The longest survivor was a patient who was buried for 17 hours. He was 21 years old and suffered only minor hypothermia.

Questions/Comments:
Gebhard Barbisch: Concerning the wearing of ski helmets: parents and children should wear helmets. If all children wear helmets, adults will also be gently forced to do the same.
Delegate: Avalanche airbag: are there any studies on the connection between airbag and suffocation?

Answer: No, not so far.

No Presentation available

Snowmobile Accident during snowstorm in northern Sweden, to rescue against time SVEFRO / Marie Nordgren and Johnny Olofsson TERCOM / AVACOM Joint Session

Presented is the rescue of a young man who had an accident on a snowmobile in the north of Sweden.

The alarm was received at 15:19 in the afternoon on March 26, 2022. A 23-year-old man, he is called "Joe" here, was missing. Joe was out on a snowmobile. When he started, the weather was still good. So he was not dressed very warmly. But according to the weather forecast, a storm was then expected and temperatures of minus 10 to minus 15 degrees.

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Joe had an accident with his snowmobile and flew two meters over the handlebars. He had pain in his left thigh and hip, but was always conscious. Joe tried to start that snowmobile, but a button to start it was missing. He had no phone connection.

Due to the weather conditions, the helicopter could not be used. The mountain rescue team searched by foot together with the Ski Patrol, without success. The weather became worse and worse, it get dark. More rescuers were called out at 6:00 pm and 7:30 pm. It was discussed with the police to continue the search only the next morning. However, the rescuers decided to continue searching during the night.
Joe tried to use his cell phone to call for help, without success. He realized that no one could come in this weather and that the only option for him was to wait.

The rescuers searched all night, 6 people in two groups. At 04.30 in the morning rescuers rested in a small hut and made a fire there, which is actually forbidden.

At 05:05 in the morning Joe could be found, 135 meters from the hut, 15.5 hours after the accident. He was sitting on the snowmobile, was conscious, had a dislocated hip, a fracture in the pelvis, pneumomediastinum and frostbite. He was hypothermic (35.5 degrees core body temperature). Joe was taken to the cabin where the fire was already burning. There Joe became increasingly confused, so they were prepared for a rescue collapse. The Swedish helicopters could not fly because of the weather conditions. At 07:27 in the morning, the helicopter from Norway (Narvik) was able to land.

What the team can learn from this mission? Trust and experience are important. Trust the feeling (and so make the forbidden fire). The position of the mountain rescuers was always known by the mission leader, the inreach was always on.

How could the victim survive: Joe was tall and heavy, he had no bleeding wounds. He sought shelter in his jacket to breathe and keep warm. He sat ON the snowmobile. He kept trying to start his snowmobile. He set his cell phone on alert mode. He was accustomed to this weather and never lost hope, dying was not an option. He never panicked.

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What can you do yourself in such situations:

Safety: protect yourself from more stress, defuse the situation in your mind, reduce chaos.

Calm: Stay calm, need resources, keep warm.

Empowerment/Engagement:
Strength, ask yourself what you can do here and now.

Connection: with yourself. Trying to call loved ones.

Hope: Telling yourself that you can handle it, that someone will come. Being Future-Oriented.

Questions/Comments:

Delegate: who planned the search?

Answer: It was the police. They have more possibilities, but they listen to the mountain rescuers.

Delegate: The accident site was close to the Norwegian border. How was the cooperation?

Answer: The mountain rescuers searched in Sweden. The helicopter came from Norway. The Norwegians are always informed when the rescuers cross the border.

Presentation-File: 20221013-04-to-rescue-against-time.pdf

SARCall, the Irish journey or a successful lockdown project MRI / Donal McNamara

What is Sarcall?

Sarcall is a web-based system that allows each team member and the team to do the following:

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- Messaging (exchange messages, The Operations Center can reach rescuers directly through the system).
- Team Member Availability Responses (rescuers can communicate if they are available).
- Incident Logs (incident logs), what happened?
- Partner Contact List
- Inter-Team Messaging (exchange messages within the team)
- Maps: it is transmitted in real time where the rescuers are located.
- PhoneFind: The position of a cell phone can be transmitted to SARCALL. Thus, the position of the person who made the emergency call can be transmitted.
- Document Resources.

This platform runs on highly reliable, secure and resilient servers located in different locations. Operations centers can manage the operation directly through the system. Interaction between the team and the incident command is possible through the system. The logbook (protocol) can be used as a record of the operation.

Why was the system introduced?
Ninety-five percent of Irish cell phone users have smartphones, including rescuers. All missing persons used the cell phone to make the emergency call. Rescue teams were already using Sarloc. Digressive calls can be reduced. The functionality of the existing alarm system was limited.

What was learned? Good old-fashioned project management skills with modern tools work in a pandemic when everyone has a common goal.

Questions/comments: None.

Presentation-File: 20221013-05-Sarcall-Donal-McNamara.pdf

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Information from our Partners and Exhibitors (TERCOM)

The following partners and exhibitors presented their products:

Petzl:	New products 2023: Mini Traxion, Pro Traxion, rescue harnesses (Falcon). Further, a video about the products LEZARD helivac Sanyard and FALCON MOUNTAIN is shown.
Taiga:	Produce work clothes, especially for people who work outside.
MND:	Avawatch. A system for triggering avalanches and monitoring avalanche releases. It can show whether an avalanche has been triggered or not, for example in bad weather. There are different triggering systems, Gazex, Daisybell, O'Belix.
ARVA:	Develop avalanche beacons for over 35 years.
API-K:	Develop products for geopositioning.
RECCO:	Search device (R9 and SAR Detector)
moPS:	Alerting systems and mission control systems for cell phones (app).
Ortovox:	Developed a new avalanche beacon and other avalanche equipment.
Mammut:	show new jackets and pants, especially for mountain rescuers, and an airbag.
UNO:	Emergency Splint (rails), Contact: mikhail.kukva@dassiet.com.
Harken:	Device for lowering and pulling up.

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Lifeseeker:	geolocation system of cell phones for helicopters and for drones.
Momentum:	software, (system for dispatching and rescuing people).
Tyromont:	rescue material
Aerosize:	Airbag for mountain rescuers, which is not integrated in a backpack, but worn around the neck.
Twiceme Technology:	Emergency data readable via a smartphone
Collins Aerospace:	Rescue winches
Bell:	Helicopters
Breeze Eastern:	rescue winches (four-strange cables)
Airbus:	Helicopters. Productsews H135, H 145.
Montura:	Clothing for rescuers

Drones and manned aircraft in U-space – Fabrice Legay (EASA)

Terminology:

Drone:	general term
RPAS:	Remotely Piloted Aircraft System
UAS:	Unmanned Aircraft System
UAV:	Unmanned Aircraft Vehicle (often used for heavy UAS)

December 31, 2020: Europe is the first region in the world where regulations for drones have been declared applicable. More than 2,000 operating licenses have been issued by EU national regulators using a completely new risk-based approach (SORA: Specific Operations Risk Assesement).

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What is U-Space: In heavily used airspace, drones and manned aircraft should be able to use the airspace side by side without danger. Manned flying objects and drones should be separated from each other without danger. To ensure that drones can safely use the airspace. To enable complex and long-range UAS operations and Urban Air Mobility.

U-Space: use of 4G/5G to serve drones. Potential conflicts can be communicated to the U-Space service provider. The drone operator is shown where to fly.

U-Space is a set of new services and specific procedures that provide safe, efficient access to airspace for large numbers of drones without airspace separation.

iConspicuity: Transmitting real-time position and/or information about other aircraft, airspace, obstacles or weather to improve pilot awareness in specific situations.
Collisions caused 137 fatalities in EASA states in 2009 through 2019. The problem is inefficient information sharing, drones, congestion from uncontrolled flying objects and inefficient use of airspace. iConspicuity is the solution.

An EASA research project (Horizon) is looking at the risk to manned aircraft from collision with drones. The consequences of a collision between drones, which are available in bulk, and a manned aircraft are being investigated. Drone design strategies will be identified that aim to limit the risk to the aircraft and its occupants in the event of a drone-aircraft collision. Draft design requirements and testing standards for future, more fragile drones to be placed on the EU market will be defined. Data obtained will be used to assess the threat posed by commercially available drones. Ongoing work will explore how the introduction of a standard for drone design and testing could help limit the hazards posed by drones.

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Questions/Comments: None.

Presentation-File: 20221013-06-EASA-Drones-U-Space.pdf

Risk-based Decision Making in Extreme Environments (Whakaari Volcanic Eruption) LandSAR NZ - GNS Science/ Nico Fournier

On 09 December 2019, 14:11pm , the Whakaari volcano erupted on White Island. 47 people were on the island at that time. 20 people died. The survivors were rescued from the island by boats and helicopters. The most common injuries were burns. At 17:00 p.m., there were no signs of additional survivors. Rescue and recovery operations were suspended due to the risk of another outbreak. Not all of the people could be located. The question now arose as to how the missing persons could be located?

In general, the question is how to make good decisions in extreme situations.

Volcano monitoring (GNS Science & GeoNet - Volcano monitoring) is mostly automated remotely, but sometimes requires working close to the active craters.

On November 21, 2012, the Tongariro volcano erupted. The volcano was previously quiet for weeks. Employees left the area shortly before the eruption. The question was how to keep them working safely.

A traffic light risk matrix was developed. This was easy to use. What risk is still acceptable?

We proceed in two steps:

1. the probability of an outbreak.
2. what are the consequences of an outbreak?

Step 1: How to calculate the probability of a breakout:

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First option: one starts from historical data and takes the average. However, this method does not take into account time periods when there were more outbreaks.

Step 2: You ask the experts. It is a quantitative risk management. This method takes time and cannot be used when quick decisions are require

Applied to the Whakaari outbreak:
Probability of an outbreak in the last 24 hours: 50 to 60 percent.
Probability of being killed while evacuating people on the island if another outbreak occurs: about 6 percent. What if there is a 50 percent probability of another outbreak in the next 24 h? Risk is calculated in advance to decide how close rescuers can go.

Questions/comments: none

Presentation-File: 20221013-07-DecisionMakingRisk.mp4

The Mount Hood Problem: the Impact of Overcrowding, Onexperience, and Social Media MRA / Christopher Van Tilburg TERCOM / AVACOM Joint Session

Mount Hood is 3427 meters high. 10'000 to 20'000 people climb Mount Hood per year. The mountain has 12 (10) glaciers. Rescues on Mount Hood are done by Portland Mountain Rescue and the Hood River Crag Rats.

There are the following problems on Mount Hood: Crevasses, Bergschrunds, fumaroles, glide cracks, avalanches, rain gullies, lenticularis clouds. If you miss the downhill route, you are completely lost (Mount Hood Triangle).

Due to the numerous alpinists who go up there, traffic jams occur, for example, in the ice gully. Some are poorly equipped. Record times are playing an increasingly important role. One problem is the social media. For example,

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someone posted that he went up in sneakers with spikes and that it went very well.

Solutions:
Social media is very important. Portland Mountain Rescue went on Facebook (portlandmountainrescue) and Instagram (@portlandmountainrescue). Information is communicated there. Portland Mountain Rescue also has a store (mountain store) and a rescue radio, which was created to reach a wider audience to help prevent emergencies (rescue radio).

Furthermore, an Incident Command System has been developed. There is medical training and technical training for rescuers. There is not often helicopter support during rescues. There are our patrols on the mountain that relay information by radio (e.g., where there are how many climbers, etc.). Rescuers have been recruited, but it is not easy to find suitable people.

One solution to limit the mass of mountain goers would also be to introduce summit fees. Mount Hood has not had this so far. Starting in 2023, you have to have a permit to climb Mount Hood. It's not expensive, but might make people think twice about whether or not they should really climb the mountain.

Questions/Comments:

Alistair Read and Gebhard Barbisch:	Reported similar experiences in their areas with false information on social media.
Delegate:	The problem with them is often that people think they know everything.
Delegate from Catalonia:	They have the same problem. People get information on social media. In Catalonia, they introduced a fine for false information. But it doesn't work because the people which where rescued are often persons who spread this info.

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Delegate:	Everyone has the same problem with social media.

Presentation-File: 20221013-08-The-Mount-Hood-Problem.pdf

Presentation of a New Electronic Avalanche Airbag System Ortovox / Patrick Wesch TERCOM / AVACOM Joint Session

What is important for an airbag system? Safety, ease of use, weight.
The airbag should prevent the person from being completely buried. Research by Pascal Haegeli, 2014: Out of 100 people buried by an avalanche without an airbag, 22 are not expected to survive the avalanche. Out of 100 people buried by an avalanche who are wearing an airbag and who are buried, it is to be expected that 11 will not survive the avalanche. So an airbag is not a guarantee to survive, but it can cut the number of deaths in half.

There are mainly two systems in airbags, mechanical and electrical.

Multiple releases are possible with the electrical systems. This can be an advantage in some circumstances. Airbags not activated is the main reason why the airbag did nothing. Twenty percent of airbags were not deployed, according to the study. For 60 percent, the problem was that the user was not "triggered" to activate the deployment. So the deployment has to be trained. This is easier with the electric ones, because it costs nothing to trigger them.

Electric airbags do not affect the avalanche tranceiver.

Usability: An electric airbag can be turned on with a button. The battery can be charged with a USB-C cable and is ready for a second deployment within 20 to 25 minutes. The system weight is small. The battery status is indicated with an LED status signal. The airbag works even in extremely cold temperatures. The product can be carried on an airplane. The handle for deployment is easy to use with

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one hand. With the conventional systems, it was a problem if the handle for deployment was forgotten to be prepared before starting. With the present airbag, the handle can be easily turned around to be ready for deployment, even if the user is already skiing and realizes that he has not taken out the handle.

A mechanical closure and a secondary protection prevent spontaneous deployment without using the handle, which would be a problem in helicopters, for example. The inflated airbag can be easily stowed back in the backpack and does not need to be folded elaborately. The leg loop must be used, otherwise the airbag may be useless. The leg loop can be easily hooked with a carabiner, even with gloves. It does not need a metal buckle on the backpack and the backpack can be taken off so easily.

The airbag is relatively light. It is the lightest electronic system on the market. It weighs 1100 grams. And the airbag is produced in Bavaria.

Presentation-File: 20221013-09-ORTOVOX_LiTRIC.

End of session: 17:15 pm

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