

Presentations of the Terrestrial Rescue Commission

Place: Zakopane, Poland
Date: October 12, 2019
Time: 0800 hours
Participants: All commissions
Chairmen: Dan Halvorsson, Dan Hourihan
Minutes: Fabienne Jelk

Simulation in Mountain Rescue 2.0: The future has begun; Prof. Matthias Jacob, Bergwacht Bayern, Germany.

Registry of Rescuer Deaths – Update and Proposal; Dr. John Ellerton, ICAR

John Ellerton - Registry:

The main goal is to analyze accidents so that they can be prevented in the future. The secondary goal is to show the necessary respect to the victims of rescue operations. The ICAR executive committee required that the data stay within ICAR, which is done. The data is secured and can only be accessed with a password. Cases can still be forwarded.

Next steps: Work document to be uploaded to the ICAR website. Additionally, the form to log deaths should be issued.

Prof. Dr. Matthias Jacob:

There is a training center in Bad Tölz in Bavaria, in which the future of simulation has already begun. Over the past 10 years, the incidents Bergwacht Bayern was involved in have increased, especially in summer. This means many technically challenging rescues are needed, for example with winches. This requires training which is as close to reality as possible.

At the training center, operations are simulated on a BK 117 trainer. Winch operations can be trained realistically. The training center is inside a hall that also contains climbing walls, an imitated cave system, helicopter, gondola, trees, via ferratas, a pool for water rescues and a hospital shock room. The pool can also

be used to simulate ice and waterfall rescues. Below freezing temperatures as well as snow and wind can be simulated. The training is comprehensive and also includes first aid. The center is also a research facility.

The center is introduced in a film.

Q: Alistair Read: How much did the center cost?

A: 11-12 million Euro. The big helicopter simulator cost 1 million.

Presentations:

20191012-01-BWB-Ausbildungszentrum.pdf

20191012-02-BWB-Ausbildungszentrum.mp4

Determination of Death; Dr. Corinna Schön, Switzerland, ICAR MedCom

Suspension Trauma Recommendations; Dr. Giacomo Strapazzon, EURAC, Italy

Corinna Schön:

Recommendation regarding determination of death. There are situations in the mountains where it is not easy to determine if someone is dead or not, and mistakes in this regard have been made. Mountain rescuers should have a basic knowledge. Why determination of death is so important: One can concentrate on victims that can still be saved either during the rescue or in the hospital. 20-30 minutes after death, one can see the definitive signs of death such as postmortem stain and rigor mortis. In the recommendation, a list shows the certain signs of death because signs can be wrongly interpreted. Postmortem stain and putrefication can also be hematomas or signs of frostbite. Therefore, training of non-medical rescuers is just as important.

Q: Could rescuers take pictures on scene and send them to the physician?

A: Yes, that should be possible. It would be helpful. It would also be helpful to be in contact with the rescuers on scene.

Presentation: 20191012-03-Determination-of-death.pdf

Dr. Giacomo Strapazon:

Talks about suspension syndrome. There is a new recommendation; MED-REC-2019-0036. Suspension syndrome can happen during climbing but also in caves, during canyoning, or working on a suspended rope. 30% of the victims had presyncope. The recommendation defines when it is considered suspension syndrome. One should never work alone on a suspended rope. When you hang on a rope waiting for rescue, you should move, especially the legs. These people need to be rescued as fast as possible. First responders need to elevate the victim's legs and put him/her in a horizontal position. As soon as the victim is on the ground, he/she needs to be put in a supine position.

Questions/Comments: None.

Presentation: 20191012-04-Suspension-syndrome.pdf

Caving Rescue – Differing Pattern of Rescuers and the Responses between Europe and North America; Drs. Roger Mortimer, USA & Iñigo Soteras, Spain

Talk about the differences in cave rescue in North America and Europe. Data about the cavers is recorded, like age, type of injuries, cause of death, etc. This knowledge facilitates choosing the optimal material during rescues. The most common reason for injury is falls, the most common injured area is the head, and the most common cause of death is drowning.

What are the differences? In Europe, caves are often vertical, which requires specific rope techniques. In America, caves are more often horizontal and, therefore, easier to access.

Conclusions:

- There are differences between Europe and America.
- Trauma is the most common injury; to the extremities, the neck and head.
- The most common cause is rockfall and falling.
- Cave diving is extremely dangerous.
- For cave rescues, take the material for the most common injuries.

- Rescuers need to be prepared for long operations.

Questions/Comments: None.

Critical Incident Support of Patients and the Team – Psychological First Aid; Dr. Alison Sheets & Charley Shimanski

Case: A helicopter crashed. The operation is shown in a video. The pilot died and one person survived. One person was never found. Charley Shimanski was the head of operations.

Many difficult situations arise for rescuers from rescue operations. They see a lot. PTSD can occur. First responders have double the suicide rate than the regular population. It is especially difficult when you know the victims, colleagues are affected, children are involved, not enough resources are available, unclear leadership or organization, dangerous terrain, the rescuer is tired, emotionally impaired, or injured. Everyone reacts to difficult situations. Usually, it passes after a few days. If that is not the case, when one has flashbacks or gets panicky, something has to be done, because this will become pathological and can lead to depression, suicidal ideation, withdrawal from social life and alcohol abuse. This requires professional help.

There is a diagram with four phases through which one can assess how much help is needed; green=ready for operations, yellow=one shows negative reactions, orange=one is injured, and red=one is ill. What can you do? Remove the affected person from the danger zone, calm him/her (for example with breathing exercises), give the person tasks (for example if they are not injured), provide a healthy environment, provide hope (plans for the future, make assurances that all will be okay).

There is a new App: First Responder Health.

Q: Delegate SAR New Zealand: This topic is very important. Are there experiences with the rescuers' families? When rescuers have troubles, it rubs off on the families.

A: It is important to involve the families. In several of our training days, the families are integrated.

Q: How do you prepare a new team member on what he/she is getting into?

A: That can be done through training and education. There are also conversations with the new team members in which this is conveyed.

No Easy Weeks – Busy August in the Polish Tatras; Andrzej Górka & Jakub Hornowski, TOPR

In August 2 people were cut off inside the Wielka Śnieżna cave when a passage flooded. The rescue started on August 17, 2019 and concluded on September 17. Because the cave was flooded and the access very narrow, the rescuers could not reach the trapped cavers. A rescue with divers was not possible as the passage was too narrow. Blasting was necessary. A rockfall followed inside the cave.

During this cave rescue, other rescues were also ongoing, such as an accident caused by lightning on August 22, 2019. Several people were hit by lightning on the Giewont. 3 people, 2 of them kids, required resuscitation. Several people were injured. We had to make sure the injured people didn't walk away because they were under shock. Clothes were strewn about and unresponsive humans were lying everywhere. The scene was similar to a terror attack. Several organizations were involved in this rescue: TOPR, LPR, PRM, PSP, OSP. There were over 110 injured people, 4 died. On August 22 at 1935 hours this rescue concluded.

Meanwhile, the cave rescue continued. On August 22, 2019 at 2150 hours the trapped were visible through a gap. Passage was still not possible. On August 30 at 1957 hours the rescuers were able to get to the cavers. Both were dead, most likely from exposure as the temperature inside the cave was -4 degrees Celsius.

On August 30 at 2003 hours a notification came in that the Kasprowy Wierch cable railway malfunctioned because it had been damaged by a storm. 436 people were stuck at the mountain station. They could not hike down because they lacked the necessary equipment. Additionally, there were children. This operation ended after 2 hours. There were no injuries. Between September 5 and

17, the cave and the surrounding area had to be cleaned of material etc. 65 TOPR rescuers were involved in the cave rescue. They spent 3231 hours inside the cave. Other rescuers were also involved (PSP, HZS, CSRG). 450 grams of explosives were used and 12.5 tons of material removed from the cave.

This intensive time could not have been overcome without the collaboration of the different teams.

Questions/Comments: None.

Presentation: 20191012-07-No-easy-weeks-TOPR.pdf

VFR Air-to-Air Collision Prevention/Limitations of „See and Avoid“; Renaud Guillermet, Sécurité Civile

How can air-to-air collisions be prevented? One possible system is “see and avoid”. 3 steps: first see, then recognize the collision danger, and then react/avoid. These 3 steps take 12.5 seconds.

The 3 steps are affected by the following factors:

Step 1, See: Depends on age, day or night, windshield, and how closely one looks at the sky. Peripheral areas are less often checked. When one is tired, the visual field can be reduced. The crewmen inside the helicopter need to communicate with each other which sectors are being scanned. On the way back, when the crew is busy with the patient, fewer people are scanning the sky.

Step 2, Recognizing the collision danger: The most difficult situation is when two objects are flying linear towards each other. The contrast of the other flying object to the background is also a major factor in recognition.

Step 3, Evasive action: If there is no transponder, there is no TCAS (traffic alert and collision avoidance system), also no instructions for the pilot how to take evasive action. There were collisions that would not have happened if no evasive action had been initiated.

The study is from 1991, but the situation today has not changed.

Other systems that could be helpful: ADS-B (automatic dependent surveillance broadcast) and FLARM (flight alarm). In order for these to function, though, all aircraft would have to be equipped with them.

The „see and avoid“ principle has its limitations, the crew needs to be aware of that. The crew needs to be trained in scanning air traffic. There is a TSB recommendation that states one should not rely on this system alone. It is also important that one flies with a clean windshield and all equipment is secured.

«See and avoid» is used often. The system has limitations. There are more and more flying objects in the sky such as paragliders or drones.

Q: Mountain climbers wear yellow glasses. Pilots should not wear yellow glasses. Are there recommendations for pilots which sunglasses to wear?

A: We have no comment on that, except class IV is not allowed.

Q: Are there many flying objects in the sky that are blue?

A: Yes, but in order to recognize an object, the contrast to the background is more important.

Teamwork for Missing People in Austria (ÖBRD/Police/RECCO); Martin Gurdet, ÖBRD

Several organizations are involved in a search operation in Austria. There is a project in collaboration with the police, Austrian mountain rescue, and RECCO called RECCO SAR.

It is a winter and summer search system. The search is done with a reflector and a detector. The reflector is passive, uses no battery, and has endless life. The RECCO SAR detector is used at the end of a winch from a helicopter. The search can be done from an altitude of 100 meters. This facilitates a quick search over a big area.

About a month ago a call came in for a hiker that had fallen off a mountain range. The relatives suspected that he was carrying a reflector, but that was not

the case. Since the initial introduction of RECCO SAR last year, it has been used 11 times.

There are currently 16 detectors in Europe.

Cases in which people were found with the device:

- Aostatal, trailrunner. The search had been ongoing all day. As soon as the RECCO SAR was utilized, within 5 minutes the person was located in a crevice. The victim didn't have a reflector but material that sent the signal.
- Mont Blanc: After a few minutes the victim was found inside a crevice. Electronic devices sent the signal.
- Courmayeur, skier. 4 people were missing in an avalanche. One person was found with the RECCO SAR. The beacon broke during the fall.
- Tour des Glaciers: It was mandatory for athletes to carry a RECCO reflector.

The system still has to be introduced in North America.

RECCO works but the reflectors need to be on the person. There is collaboration with certain brands. Shoes and summer clothing also include reflectors, and individual reflectors are also sold.

The goal of collaborating with other brands and manufacturers is to get reflectors to as many groups as possible; for example, E-bikers. As many organizations as possible should use the system. Costs can be reduced though RECCO SAR (less flying time).

Questions/Comments: None.

Presentation: 20191012-09-OB RD BMI RECCO.pdf

Drones – ICAR Commission Presidents Speak on the Impact of Drones on their Disciplines [e.g. collision avoidance, payload capacity, search capability]

(including avalanche), accessibility] and Concludes with Feedback from all Delegates

Charley Shimanski – Air Rescue Commission

Drones are used in the search for missing persons but are also a danger in the airspace. Collisions or near misses between drones and helicopters can happen. The number of drones increased markedly over the past few years. This carries dangers. The FAA supports detailed regulations, registration of drones, and training for their use.

Dr. Peter Paal – Medical Commission

Studies were done in Norway and Sweden for the use of drones in medical areas. The Swedish study focused on cardiac arrest outside the hospital area. In such cases life-sustaining measures have to be taken immediately. Defibrillation is important. The drone can be equipped with AED and be carried to the patient. The drone is sent by the emergency center. Canada also uses drones with AED. These are stationed at police and firefighter stations. The drone saved 7 minutes in suburban areas and 10 minutes in rural areas. In Stockholm it saved 19 minutes. The defibrillator arrives faster at the patient and, therefore, increases the patient's survival rate. In Norway the drone was used to communicate between first responders and the emergency dispatch center.

Dr. Will Smith – Avalanche Commission

Drones can be used in avalanches in the following ways:

- Forecast: The drone can be flown to the avalanche mountain side where someone wants to ski and gain insights on the conditions.
- Mitigation of risks: Drones are used for avalanche control blasting or to gain insights on the avalanche site before rescuers are sent in.
- Locating: The avalanche can be visually searched with a drone and can show, for example, skis or mittens. Drones can also be equipped with search sensors.
- Treatment: Drones equipped with material for first aid can be on scene ahead of the rescuers.
- Evacuation: Bigger drones that can dig someone out. The drone would also start with first aid. That is the dream of the future.

Gebhard Barbisch – Terrestrial Commission

Drones can be used for locating buried persons in avalanches and for missing persons.

The legal status of using drones in rescue has not been clarified yet. The technology is still relatively new. The regulations are too strict; for example, that one can't fly at night or on weekends. Rescue organizations need to be an exception. Since May 24, 2019 there is an EU regulation 2019/947 concerning rules and processes of unmanned flying objects. Additionally, special training is required. Training of drone pilots should be done collaboratively; for example, drone pilots from mountain rescue, the police and fire department. That way everyone is speaking the same language. The personnel need to be well trained. There needs to be a step-by-step process. The cost of drones goes from low to very high.

Renaud Guillermet – Air Rescue Commission

Drones bring dangers. The communication between pilots and drone operators needs to be improved. There need to be regulations for professional use of drones. This has already been discussed with EASA. There are new rules: EU 2019 945 and EU 2019 947. These were published on June 11, 2019. All drones over 250 grams will be registered before mid 2020.

EASA published a paper regarding U-Space, which is a space in which one can fly without danger. If a helicopter enters that airspace, the drone lands automatically. EASA already took position regarding the U-Space. At the end of 2019, it will send its position to the EU. Additionally, EASA has started to deal with the issue of collisions. There are recommendations regarding this. More recently, there is a research project.

ICAR has contacts both in the FAA and EASA. Within ICAR everyone needs to be informed. In conclusion a video showing the dangers of collisions between drones and helicopters is played.

Questions/Comments: None.

Satellite-Based Solutions for Search and Rescue Operations; Benoit Vivier, EENA & Vojtech Fort, European GNSS Agency/Eurisy

Galileo offers solutions for search and rescue. GSNN (global navigation satellite system) is a constellation of satellites that deliver signals from space and the position and time data to GNSS receivers. The receivers then use this data to determine location.

The Galileo SAR Service consists of 2 components:

1. Forward Link Service (2016). Emergency calls are received by the rescue service in a timely manner (within 10 minutes). The more satellites and MEOLUTs are available, the better the coverage. A precise location is available.
2. Return Link Service (starting 2019). The person who initiates the emergency call is informed that his message was received. This allows recognizing false alarms and the stress of the victim is reduced.

There are 3 basic types of devices that can be used: EPIRB (marine rescue), ELT (air), and PLB (for individuals). The personal devices are already on the market.

In the future there will also be an emergency notification service, for example for earthquakes or volcanic eruptions. What is already available today are cell phones with dual frequencies. This allows for a location determination of less than 1 meter.

There are other projects in the works. For example, they are working on exact location determination even in bad visibility, like inside buildings for the fire department. This location determination is based on GNSS, EGNOS and IMU/RF ranging.

Presentation: 20191012-15-GSA_SAR_VF.pdf

Advanced Mobile Location:

How can the location be sent to the emergency dispatch centers? The solution is the Advanced Mobile Location (AML). When 911 is called, the position is automatically captured with the help of GNSS and Wi-Fi and sent by text message to the dispatch center. This happens automatically. The caller doesn't have to do anything. If the location service is disabled on the cell phone, it is automatically activated.

How is it activated? In certain countries the system is not yet active, for example Switzerland and Italy. Other countries like Norway and Germany already use AML. The position that is transmitted is highly accurate. This system can help if the caller doesn't know where he is; for example, in the mountains, in foreign cities, when children call, or if the call ends abruptly. The altitude is also transmitted, for example on which level within a building. There are technical limits with roaming. When people travel to other countries, it doesn't always work.

C: Martin Gurdet: There is a video about a paraglider accident that shows the system. When the call comes in, one knows exactly where the caller is.

Q: Gebhard Barbisch: What happens when you call 112? In Switzerland, for example, the call goes to the rescue service, in Austria to the police.

A: That is a big topic. 112 is the uniform emergency number in Europe. Each country decides for itself how these calls are routed. However, if the call goes to the police, the information can still be relayed to the rescue service.

Presentation: 20191012-1600-AML.pdf

End of Meeting: 1540 hours

For the English Translation: Olivia A. Cashner