Presentations Terrestrial Rescue Commission

Place: Chamonix, France
Date: October 18, 2018
Time: 8:15 a.m.
Participants: Members Terrestrial Rescue Commission
Members Medcom (from 10:30 a.m. to 11 a.m.)
Members Air Rescue Commission (from 2 p.m. to 2:30 p.m.)
Members Avalanche Rescue Commission (from 2:30 p.m. to 4:30 p.m.)
Chairmen: Gebhard Barbisch, Kirk Mauthner
Minutes: Fabienne Jelk

Backcountry SOS; Stephanie Thomas, Teton County SAR

Stephanie Thomas introduces the TCSAR Foundation whose purpose it is to save lives through recruitment, training and equipping of volunteers. The difficulty in the Tetons is locating missing and injured persons. Cell phone coverage is either non-existent or poor and coordinates can be imprecise. This issue was solved with the Backcountry SOS App through which coordinates are transmitted. The App uses little power, has good contrast, and can be used without having to log in to an account. The App uses text messaging. The App also allows the relay of information such as injuries.

For questions info@tetoncountysar.org; www.tetoncountysa.org, www.backcountryzero.com.

Q. Are you advertising the App?
A. The App will be released at the end of the month. It will be advertised in snow and avalanche workshops. An advertising

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campaign has already begun as well. This information will also be communicated through visitor information centers and social media.

Q. Does it only work on iOS?

A. Currently, yes.

Q. In Europe a lot of people use android. The Advanced Mobile Location (AML) service has been available for a few months. The phone automatically sends the coordinates when 911 is dialed. No App is needed. The system works very well. There are also Apps available in Europe, but they need to be advertised. The simplest way is to have the coordinates sent automatically when an emergency number is dialed.

A. Europe is more advanced in that matter. 911 can locate the phone but sometimes that doesn't work so well. It would be much better to have the coordinates sent automatically.

File: 20181018-01-BackcountrySOS.pdf

EURISY-Satellite Applications for Mountain Search and Rescue; Fredrik Bendz, Aarrestad

What can satellite applications do for mountain rescue? There are three types of satellite applications for search and rescue: navigation, communication, and terrain observation. The benefit is that one can see where the victim is in relation to the rescue teams. It also shows potential hazards such as rock falls and avalanche zones. The images can be sent directly to the people in the field. Maps can be improved. GNSS can drastically improve the speed and accuracy of locating a victim. The technology has been available for a few years but it's

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not used everywhere. The question is why not? The goal now is to document where GNSS is used, where there are issues and successes, and what the challenges are. We would like to build a community with experience in using GNSS that is interested in this technology and who could connect users and providers. If you are interested, please let Fredrik know. Currently, the cooperation and exchange of knowledge between organizations is not established. People are not trained in this technology and the technical expertise is minimal. Different organizations use different applications or do not have the financial means to acquire this technology.

Eurisy recommendation: Uniform European standards for locating victims that use an emergency number; uniform data standards to enable the coordination and data exchange between teams; user support in introducing fitting solutions.

For more information Alexandra.jercaianu@eurisy.org; Toby.Clark@eurisy.org.

Q. Are there other satellite applications in other countries with whom you work?

A. Yes, there will be a common system. There is coordination with the USA and Russia. The systems are open to everyone and can be used by everyone. The more satellites, the more accurate the location; and satellite numbers are increasing.

File: 20181018-02-Eurisy.pdf

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Performance Criteria of Rope Rescue Systems - A Canadian Model; Kirk Mauthner

In 2016 various tests were done on rope systems that are used in rescue with regards to their components. Key elements are mass, fall height, rope used, maximum strength, dynamic expansion. Performance criteria are needed because not all ropes work in all rappelling devices. A basis to compare the different systems is needed so that the data can be analyzed and decisions made. The highest risk for rope systems is in the edge transition. This was also tested. The criteria were 1-meter fall on a 3-meter rope and a mass of 200 kg (equal to 2 people incl. equipment). The results of all the testing are shown. The human factor has to always be considered as well. One usually doesn't contemplate the failing of one system in a 2-system rope rescue. The purpose of the tests is to compare various rescue systems and improve them if necessary. See TER-REC0005.

File: 20181018-03-Performance-Rope-Criteria.pdf

Rock Anchor Corrosion, UIAA SafeCom; Lionel Kiener, UIAA

UIAA develops standards for technical equipment and recommendations on the correct usage. The goal is to reduce the risks for climbers and alpinists.

https://www.theuiaa.org/safety-standards/;
https://www.theuiaa.org/safety-standards/certified-equipment/;
https://www.theuiaa.org/safety-standards/recalls/

There are different types of corrosion. This presentation is about stress corrosion cracks. There was an incident on San Vito lo Capo on the La collina dei Conigli route. The lower hook on a belay station broke while the mountain guide was rappelling. The load was less than 100 kg. The anchor had been set

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7 years ago and had last been used 2 days before the incident. There are no visual indicators that the anchor is bad.

Several factors lead to corrosion. Mainly chloride; salt, with the worst being magnesium chloride, calcium chloride and sodium chloride, and chloride from the sea that is retained within the rock. Other factors include temperatures above 30 degrees, humidity, location, rain, and type of rock.

Temperature: Corrosion can start at 20 degrees and higher temperatures benefit corrosion. In direct sunlight, the temperature at the anchor can be much higher than the ambient temperature.
Humidity: Low relative humidity between 20 and 70% is unfavorable.
Location: Coast, wind, within 30 kilometers of the ocean, but there is no clear limit as winds with high salt concentrations can travel up to 100 km inland.
Rain: Lack of rain washing out the salt around the anchor.
Rock type: Limestone and dolomite rock are unfavorable, probably because of their high calcium and magnesium content.

Worldwide there are 2-3 million set anchors. There have been few accidents. Stress corrosion is influenced by the material and design. Welding seams are an issue. Sometimes manufacturers don't use the material according to their declaration. The information concerning the material is incorrect. This is not always the manufacturer's fault but his material supplier's.

Several tests were performed. In Thailand they did a long-term test with different materials. The results are presented. After 3 years there were no stress fractures but the cheaper materials showed first damages. 6Mo and titanium fared the best.

When climbing one should pay attention and ask local climbers. Pay attention to the anchor's appearance: cracks, rust colored, different colors (=different

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materials). There is stress corrosion without rust or other visible indicators. Anchors can be tested with a hammer. If in doubt, secure independently; set new anchors.

For questions: Liokiener@yahoo.fr.

Q. Have you performed tests in caves? There was an accident in a cave in Croatia where a Petzl anchor broke.

A. There shouldn't be any stress corrosion inside a cave because of the temperature. Our testing was focused on stress corrosion. The material can be sent in for analysis.

File: 20181018-04-UIAA_Safecom.pdf

Proposal to Establish a Fatality List for ICAR Rescuers; Ellerton & Tomazin

The mountain rescuers' deaths during training and missions should be analyzed. The goal is to start a survey and to analyze the accidents during rescues and training. The records will also be used to honor the fallen in the line of duty. Data needed include a picture and short biography for the honoring and the police report for the analysis. Both lists require date, age, gender, country, title (for example pilot), what type of operation, and circumstances of the accident. The audience is asked how they feel about this idea. Questions that still need answered: how will the data be collected, where will it be published, who analyzes the data, how many years back do we go?

For questions and suggestions: mountain.medicine@alpine-rescue.org.

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Discussion:
Stephanie Thomas: It is a good suggestion. The collection of data shouldn't be that hard.

Member Mountain Rescue Ireland: Sensibility is required, especially vis-à-vis the other rescuers. For whom is this data?

Is suicide also a topic? This is a very sensitive topic. First responders have a high rate of suicide. This should not be excluded from this data collection, if the family agrees, but it also should not become the main focus of the data.

Should incidents from prior to 2000 also be listed?
Yes.

Gebhard Barbisch:
It is an important first step, but we also need to include incidents without fatalities (near misses) so that we can learn from them and not repeat them.

File: 20181018-05-ICAR-fatality-list.pdf

Swedish Mountain Rescue through 300 years and 40 years; Rickard Svedjesten, Marie Nordgren & Stephen Jerrand, SVEFRO
The biggest issue in Sweden is the length of the Swedish mountain range. It takes a long time until help can get to the mountains.

In 1718 the Swedish army invaded Norway. Shortly before New Year's, 5800 soldiers retreated from Trondheim. Over 3000 of these soldiers died in a snowstorm. The bodies were left in the mountains. That was the beginning of the Swedish mountain rescue.

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40 years ago, in February 1978, a tragic accident happened in Jämtland. Nine people started a tour, 8 of them died in a snowstorm. The morning of the accident it was -16 degrees. The group had little mountain experience. After a first ascent, one of them was quite exhausted. The group was not aware of the weather forecast. When the snowstorm hit, they wanted to build a bivouac. They did so on a crag. They kept feeling worse. The first of them died. After 3 days, the sole survivor decided to search for a cabin. He was found by two fishermen. Due to his behavior, they thought his was drunk. When the rescuers arrived at the accident site, there were bodies and blood all over. They had dug the bivouac with their bare hands. The survivor was bathed in 40-degree water. Back then that was how it was done. He later described this as his worst experience. Both his hands had to be amputated.

Lessons learned: Make decisions before hypothermia sets in. Don't assume well-trained and well-equipped mountaineers don't need help. Feedback for the rescuers is important. Psychological support for the rescuers is necessary. The work ICAR does is important to exchange experiences. This incident was the start of a movement to a well-trained rescue organization in Sweden. The government took over responsibility (Mountain Safety Council of Sweden). The communication has improved considerably. A lot has changed; the type of tourists, the material, the climate, etc., but the mountains have not; beautiful yet sometimes deadly.

File: 20181018-06-Mountain-Rescue-Sweden.pdf

Using Cable Clamps as Anchors; Rémi Pélisson, PGHM

Paragliding accident on August 18, 2013. Paragliders can get hung up in cables from gondolas, powerlines, etc. For rescuers the difficulty is how to secure

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themselves on the cables/lines when being flown in by helicopter. Securing oneself has to happen rather quickly. In this incident the rescuer wanted to secure himself on the cable with a sling, which was extremely difficult given that the rescuer wasn't stable when he was attaching himself. Additionally, the winch cable wasn't always taut, which was also a risk for the helicopter. The sling also carried the risk that the rescuer could slip down the cable. The situation the rescuer was in was very dangerous, which is why the cable locking device was developed. The device allows the rescuer to secure himself to the line. The device is presented. The development is in cooperation with SMOP-Altim.

Q. How does the rescuer get to the victim? The helicopter cannot position the rescuer exactly where he needs to be. How can the rescuer overcome the distance?

A. Through classic methods, for example a rope pulley. The cable locking device is only for initially securing oneself. It is not meant to be worked with. It is also used again before being flown back out.

Work Safety Regulations, EN- und EASA-Regulations and the Consequences for Mountain Rescue, Example Bergwacht Bayern; Herbert Streibel

Which regulations need to be considered with regards to materials used in mountain rescue? In the crossline are the EU regulations [i.e. 2016/424 (PPE)], labor protection law and technical regulations, DGUV regulations (accident prevention), EASA (regulations for air traffic, certification specifications) and medical products law. The question keeps coming up if the systems used in rescue are authorized.

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For example, rappelling with a stretcher with friction knots/dead-man's switch and link between rescuer/patient: Does the ATC have a CE EN 341? Release of black diamond? Is the testing by BW-ZSA conforming with the PPE rules? → CE0158 EN 341:2011 2/D. Additionally, there is an ICAR recommendation that systems that are not certified, or if parts are not used as noted in the manufacturer's instructions, they have to be tested by an independent authority.

For personal carrying device systems (PCDS) the following norms apply: EASA CM-CS-005 → Simple PCDS (max. 2 people), CE0123 EN 12277C Harness, CE0123 EN 1277D Chest Harness, CE 0082 EN362 Carabiner, CE0082 Dual Connect Adjust → EG-Prototype Testing 89/686/EWG and ISO 9001 and EASA CM-CS-005 Appendix 1.

And when questioning whether or not the system is authorized, one also has to ask what is it authorized for. CE…. EN1497 Rescue Harness raises the question what is a medical product, accessory to a medical product, accepted as a medical product by the appropriate authority? → Class 1.

EASA abandoned regulation PAD 15-117.

Consequences for working with Air Rescue, what needs to be watched: annual inspection of PSAgA, documentation of the inspection, training of specialists for PSAgA, PSA regulation EU 2016/424 (alt 89/686/EWG) DUGV 312-906, visualization for the helicopter crew.

In summary: PPE, PCDS, and rescue means require a CE, PCDS in addition to EASA: CM-CS-005 Appendix 1, safety factor 7 for metallic elements and 14 for textiles, max. operational lifespan according to manufacturer, annual inspection and documentation by a specialist PSAgA. Medical products require a representative for medical products and annual inspection by the manufacturer

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→ familiarization and practical training in application of PSA/rescue techniques at least once a year with documentation.

New for mountain rescue are the DGUV rules and regulations and PPE rules [for example 2016/424 (EU)] for mountain climbing equipment, knots → risk analysis, risk assessment, operating instructions.

Q. The testing methods are also known in the North Sea.

A. To think that one has to improvise in mountain rescue is the wrong thinking.

File : 20181018-08-EN_EASA_Mountain-rescue.pdf

The Effect of Communication Equipment on Avalanche Transceivers; Illari Dammert, Mammut

Avalanche beacons were developed to find people buried in avalanches. Transceivers work on a standardized international frequency: 457 kHz, ETSI EN 700 318.

Radios are often used for communication and analog devices have been replaced by digital ones. Every electronic device sends electromagnetic signals (static). The channel access mode makes the difference. There are two systems: Tetrapol/Polycom (FDMA, Frequency Division Multiple Access) and Tetra (TDMA Time Division Multiple Access). Various radios and transceivers were tested to see what influence radios have on transceivers.

Results: In send modus there is interference if the devices are within 10 cm of each other. In search mode it depends on the channel access mode of the radio. Tetrapol/Polycom (FDMA) has no interference if the distance between the

devices is more than 30 cm. Tetra signal search shows interference within a distance of 30 cm in 6 out of 9 devices, 40 cm in 4 of 9 devices and 100 cm in 2 of 9 devices. Tetrapol/Polycom (FDMA) course search shows interference in distances within 30 cm in 7 of 9 devices and 100 cm in 2 of 9 devices. Tetra course search shows interference within a distance of 40 cm in 7 of 9 devices and 50 cm in 2 of 9 devices.

In Summary: The interference of radio signals with transceivers in search mode depends on the channel access mode of the radio; Tetrapol/Polycom (FDMA) or Tetra (TDMA). In send mode all radios need 20 cm distance to the transceivers. In search mode it needs to be a minimum of 50 cm. Manufacturers' recommendations should be observed.

Q. We use radios that use DMR. Have you done tests with those?

A. No.

Q. What could the results be?

A. We only focused on Tetra.

Q. We also conducted tests last winter and found out that headlamps also cause interference with transceivers.

A. The problem is that headlamps are tested for their light source but not with regards to interference with transceivers. Many are unaware that headlamps can cause interference. When using headlamps, they should be used in their highest light mode as that uses LED which has less interference.

Q. Can the microphone of the radio interfere with transceivers?

A. It's possible, but certainly less than the actual radio.

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File: 20181018-09a-The-Effect-Of-Communication Equipment-on-Avalanche-Transceiver.pdf
20181018-09b-The-Effect-Of-Communication Equipment-on-Avalanche-Transceiver.pdf

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A New Generation of "Beacon" in the Mont Blanc Area; Océane Vibert, La Chamoniarde

He talks about the Vallot bivouac that is situated on the normal route up Mont Blanc over the Refuge du Goûter. The Vallot bivouac is in an area where alpinists often get lost. It is a shelter hut that is hard to find in bad weather. Several people died because they couldn't find the hut. Therefore, a solution was being sought on how to guide the alpinists to the bivouac. Additionally, a new radio was put in that works with both analog and digital functions. For an emergency call, the analog function is being used. This kind of radio is now in 17 huts. Remote monitoring by PGHM is necessary. The device can be checked from the base station. PGHM can also call the radio and listen to see if anyone is in the hut because often climbers don't hear the call. The radio is being used approximately 10-20 times per summer. How are we going to guide people to the shelter? With a siren (a regular ship's siren uses 12 volts) and a lamp (red light that is more visible in fog and works like a lighthouse).

Iceland Glacier Crevasse Mapping Project; Ágúst Þór Gunnlaugsson, ICESAR

Iceland's glaciers cover 11,000 km2; that equals 11% of the island. Most of the glacial area is flat. This is interesting for tourists. However, volcanic eruptions can change the landscape dramatically. Climate change makes the glaciers

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thinner which in turn creates crevasses in areas where there haven't been any. These crevasses are open year-round.

A tragic accident in 2010 in Langjökull led to the establishment of the mapping project. The data for mapping is taken from satellite and air images. The map shows roads for vehicles and hiking routes that are safe. Important information can be obtained from Lidar maps. These are made with a scanner attached to a flying object in which a laser beam scans the ground. The most dangerous crevasses are marked in red on the maps. The maps are free. They are not a guarantee but a reference and it is helpful for people on the glacier. The areas on the map are marked in 3 different colors: green=safe, yellow=safe in winter but dangerous in summer, and red=unstable, big crevasses. Iceland also has to deal with thermal features that melt the ice continuously. Such an area is marked red. For all glaciers printable PDF maps were made that can be viewed on smartphones, tablets, computers or GPS. The maps can be found on the web at www.vefsja.iskort.is and www.safetravel.is. The maps are updated annually and each November the latest versions are uploaded.

For more information: agust@vedur.is or agustth@gmail.com.

Q. How did you get the satellite data? Was it free? Was it difficult to get the satellite data?

A. The Lidar maps were paid for with government money. The satellite images can be retrieved for free from the geological institute.

File: 20181018-11-iceland_crevasse_mapping_project.pdf

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Climbing Accidentology and Prevention; Sylvie Viens, FFME

Several statistics are shown. Accident causes: 5x falls, 2x rock falls, 8x human errors, and 1x broken vertebra from a fall during bouldering. Bouldering accidents have increased. Bad climbing accidents often involve well-trained climbers.

Two causes of accidents could be avoided: human errors in making knots and securing errors when using, for example, Grigri. Preventative work was done to establish rules for securing. Additionally, builders of bouldering walls were contacted to potentially limit the height of those walls to avoid head-first falls from the highest points of the walls. Researchers from other areas were also involved to support the exchange of knowledge. Clubs are being supported. Awareness will be promoted.

More information www.ffme.fr.

File: 20181018-12-FFME-Rock-Climbing.pdf

End of Meeting: 5 p.m.

For the English Translation: Olivia A. Cashner

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