



## Presentations Terrestrial Rescue Commission

Place: Soldeu, Andorra  
Date: October 20, 2017  
Time: 0800 hours  
Participants: Members Terrestrial Rescue Commission  
Members Air Rescue Commission (1030-1100 hours, 1500-1600 hours)  
Members Avalanche Rescue Commission (1100-1430 hours)  
Chairmen: Gebhard Barbisch, Kirk Mauthner, Patrick Fauchère (1030-1100 hours, 1500-1600 hours) and Dominique Létang (1100-1430 hours)  
Minutes: Fabienne Jelk

### **Rotor versus Rock – Main Rotor Strike during HEC Mission (Matt Müller, Kananaskis Country Public Safety)**

Talks about an incident with a Bell 407 helicopter. The accident happened on Mount Yamnuska which has 150 climbing routes. The rock face is not very stable, and it is often very windy. The call came in on June 26, 2017 at around 1400 hours. A rope team consisting of 2 people made the call. One climber was hit by a rock and sustained neck and throat injuries. The rescuers agreed to a direct sling rescue. The rope used was 61 meters. As the helicopter flew to the wall with the rescuer on the longline, the rotor touched the rock face. At that point he only had a 200-foot rope, so he had to fly close to the wall. The pilot initiated an emergency landing. The rescuer was able to detach himself shortly before the landing.

A second team was then sent in to rescue the people. An investigation was initiated internally as well as through the Alberta government. The pilot was temporarily suspended from the rescue team.

What did we learn from this incident?

- Do a recon flight with the longline without the rescuer before the actual rescue.
- Remove the door and ski basket so that the pilot has better visibility.
- More training with 200-foot and longer longlines, in vertical terrain, training with the pole to get to the wall for emergency landings.

- Q. At what time did the incident happen?
- A. 1500 hours.
- Q. When the rotor hit the rock, did the pilot feel energy of being pulled down?
- A. The pilot said it shook immensely. He had to stabilize the helicopter.
- Q. Is the pilot always by himself in these scenarios?
- A. No. There is a recon flight with everyone on board and then the pilot flies by himself.

*File: 20171020-0800-Kanaski-Rotor-Rock.pdf*

### **Rescue on Horcados Rojos – 300 m Wall – Picos de Europa Team (Bomberos de Cantabria)**

Show an operation in Cantabria. The rescue area consists of 34% coastline, 33% mountains, 3% caves, 7% HEMS, 13% ocean. Helicopter used is the Bell 412 EP. The incident happened in July 2016. Two climbers fell on the south face of the Horcados Rojos Mountain. A winch rescue was not possible. The rescuer and physician were rappelled on a 150-meter long fixed rope. The patients were stabilized on the stretcher. The rescuer and patients were lowered another 45 meters and flown out by winch. The patients were rappelled using a cargo brake. There were three winch operations: Stretcher, physician, and the rescuer with the two patients.

The following questions should be considered when victims cannot be flown out directly: Approach from above or below, cargo brake versus guided load brake, how do you get to the wall and away from it with the winch, counterweight versus traction.

*Files: 20171020-0830-Cantabria.pdf  
20171020-0830-Cantabria.mov*

### **Backcountry Zero: Rock Safety and Self-Rescue Skills (Stephanie Thomas, Teton County SAR)**

Introduces the Backcountry Zero program. Goal is to reach people who spend lots of time in the mountains but do not have formal training. Several training options are offered for this category of recreationists. This is done in cooperation with different partners such as climbing experts and mountain guides. The main questions that come

up are: how can we reach other experts, how can we take training to improve personal skills to the rescuers who already have formal training but have a personal history of accidents, how can a rescuer use parts of the "Mind Strength" project to reduce stress in rescue operations, what do other teams do in this area?

*File: 20171020-0900-Backcountry-Zero-Stephanie Thomas.pdf*

### **Rescue Operation Hochferner North Face (Matthias Hofer, BRD-AVS)**

Talks about an accident on the Hochferner steep ice on October 22, 2016. Four mountain climbers lost their lives. They were all members of the mountain rescue. The accident happened at 1108 hours at the transition to the flats. Two climbers are caught by an avalanche.

The alarm came in at 2324 hours. The information was that three mountain climbers climbed in to the Griessferner north face and hadn't returned. Thirteen rescuers started at night towards Griessferner and Hochferner north face. One rescuer discovered reflective pants at the foot of the Hochferner north face. Two mountain climbers were found dead at about 2700 meters. At 0530 hours the rescuers were informed that there were a total of 4 climbers.

At 0735 hours on October 23, 2016 the Pelican 2 took off from Brixen and recovered the two climbers. About 40 rescuers, 1 helicopter, 5 avalanche search dogs and 1 Recco. Single search flights confirmed an avalanche about 250 meters above the search area. Above the fracture, climbing tracks were seen. One of the cell phones of the victims still worked and a Rega helicopter with an IMSI catcher was called in. The technicians of the IMSI catchers did not believe that the device was still in the wall. The search was unsuccessful by evening.

On Monday, October 24, 2016, the search continued with about 20 rescuers and Recco devices on the avalanche cone. Additionally, all crevasses and holes were searched. The search again did not turn up anything and was suspended in the early afternoon. At the same time rescuers were sent on the descent route. This search had to be suspended just below the top of the Hochpfeiler. In the afternoon they tried to search the upper wall and the summit area as well as the descent route with two

helicopters and Recco. The weather conditions hardly allowed flights. The search was suspended as night fell.

On Tuesday, October 25, 2016, the Austrian police tried again to ping the cell phone with the IMSI catcher. The data was transferred to maps. That same day they found out that one of the climbers had a helmet with an integrated Recco reflector. Two to three weeks prior the Recco SAR device had been tested in this area, and it was decided to use that device. On Wednesday, October 26, 2016, the pilot received a strong Recco signal at an altitude of 3100 meters; 30 meters above a partially buried person was sighted. The search was then continued with Recco SAR and Recco R9. At 1750 hours the fourth person could be unburied.

In summary:

- Difficult combined operation above 3000 meters for mountain and air rescue.
- No landing possibilities for the helicopter.
- Unstable weather with bad visibility and strong wind gusts.
- Great pressure due to the rescue of colleagues.
- Good coordination from the operations command.
- Good collaboration with the helicopter crew.
- No or wrong indicators from IMSI catcher.
- Net coverage plan matched the location of the people.
- No success using Recco R9 directly from the helicopter, and many disturbances in ice and snow.
- Fast and simple search with Recco SAR and small-area search with Recco R9.

Insights:

- Rescuers for such missions need extensive alpine experience and training in alpine as well as flight technical areas.
- The helicopter crew needs extensive flight technical experience in alpine environments.
- Knowing and being proficient in each other's standard procedures are the basis of the success of such operations.

Q. Two comments: France doesn't have an IMSI catcher. They are expensive and special permits from the authorities are needed, which

usually don't arrive 2-3 days after an incident and by then the batteries of the cell phone are empty. In Chamonix such avalanches also happen in summer. Therefore, the avalanche beacon should also be used in summer. That would have made the rescue easier.

- A. The IMSI catcher came from Switzerland. It has to be available on scene or there won't be any success in using it. The recommendation to carry avalanche beacons in summer is somewhat difficult as one already carries a lot of equipment. One would have to also carry shovel and probe.

*File: 20171020-1000-Einsatz-HochfernerAVS.pdf*

### **Anti-Rotation Systems for Helicopter Winch Recovery (Ennio Rizotti, CNSAS)**

Presented is an operation in which the helicopter downwash affected the stretcher and the rescuer and put them in a spin and so landed. Shown is the anti-rotation system from Kong which prevents the spinning through a rope that is connected to the stretcher. The system disconnects automatically if the rope gets caught, for example in trees, and experiences 45 kg of resistance. Also shown is a device that allows one to keep his hands free. It is also made by Kong and is attached to the stretcher. Certain things on the device still need improvement.

*File: 20171020-1030-CNSAS-ANTI ROTATION SYSTEM.pdf*

### **UAvSAR in the Rigopiano Hotel Accident, IT (AINEVA)**

The incident happened on January 18, 2017. The hotel Rigopiano was buried in an avalanche. Twenty-nine people died. The extent of the avalanche was not particularly big but the snow contained much material such as trees and rocks which destroyed the hotel. The avalanche rotated the hotel by 90 degrees. The difficulty in the rescue lay in the many different organizations that were part of it such as the military, fire services, and police. Over 100 rescuers were present on scene, many without avalanche beacons. This made coordination more difficult. Different devices that are normally used in terrorism were used to find buried cell phones.

Snowfall between January 16 and 19 yielded decent amounts but not remarkably so. However, the typology of the snow was special. It was very cold. Therefore, avalanches with loose snow that accelerated quickly and were "self-feeding" were triggered. Two air masses collided causing orographic interaction and created snow dunes of 4-5 meters. Problematic was the lack of data for January 11 through February 1. Only one usable station existed in the whole region. Additionally, the snowfall continued along with strong winds. Additional avalanches were possible. The area also experienced earthquakes over 5.0 at 1024 hours, 1114 hours, 1125 hours, and 1434 hours. 300,000 people were without power.

Q. You said the main problem was coordinating rescuers. How long did it take until there was a plan?

A. We had many plans. The first rescuers arrived in the evening with touring skis. Due to the earthquakes there was a delay in getting the rescue started. The problem was the laws. Certain rescuers were not allowed to use certain helicopters.

*File: 20171020-1100-RIGOPIANO-HOTEL.pdf*

### **The odor of the human breath can drive avalanche search and rescue dogs to discover a buried victim under the snow (Silvana Diverio, GDF)**

Avalanche dogs are very important in avalanche rescue. Presented is a study in which they wanted to find out if dogs can find victims buried in the snow solely by their breaths.

The following experiments were done:

- Can avalanche dogs locate human breath under snow?
- Can avalanche dogs locate human breath in 1 meter of snow?
- What position do the most successful dogs take when they search for the victim and then find it?

Results:

Dogs can locate human breath in 1 meter of snow. Certain positions the dogs took meant success, others failure (ears forward and looking downward meant success,

looking at the dog handler meant more likely failure). How much breed is a factor still has to be researched. The influence of environmental factors on the success need to be investigated further; as well, which components in human breath are detected by the dogs and could be used as markers. Dogs can differentiate between the presence and the absence of human breath.

*File: 20171020-1400-GDF.pdf*

### **RECCO SAR New Search Technology (Lennart-Recco, Barbisch-ÖBRD)**

The Recco detector sends a direct signal to the Recco reflector. The reflector reflects the signal back which can be heard by the operator of the detector. Advantages of the reflector: simple antenna with a diode, small production cost, no battery, unlimited lifespan. The Recco detector can also find other electronic devices.

The Recco SAR is shown. The detector is attached to a rope on the helicopter and can be flown by different helicopters as external load. The detector can also be transported inside the helicopter or vehicle.

A video of the Recco SAR is shown.

Recco SAR works on the same frequency as the Recco R9. The reflectors can be used year round by different people and activities, including children and people with dementia, in different areas such as oceans, glaciers, and forests.

A video of a test flight is shown.

Recco SAR can also be used in avalanche rescue, especially if the victims cannot be found with Recco R9, or have electronic devices on them. Cars as well as snow scooters can be located. It is also an alternative if there is a big risk for the rescuers or a big area needs to be searched.

Cell phones can be located up to a distance of 15 meters (in the air), but it depends on the make and the position of the cell phone. Transceivers without Recco reflector can be located up to 25 meters, cars and snow scooters without reflector 60 meter, a person with a Recco reflector on the body up to 250 meters, on the helmet up to 600 meters. Distances deviate in snow.

Range in snow: Cell phone 1x1 meters, Recco reflector on body 4x4 meters, Recco reflector on helmet 10x10 meters.

Limitations of the system: If the person is lying on the reflector and no snow is under the body, there is no signal. If there is snow beneath the body the signal is reflected. If the body shadows the reflector, the distance is reduced. When flying at high altitude, many signals are received. This can be a problem in ski areas, so one would have to fly lower.

Recco SAR was used in the rescue operation on Hochferner in South Tyrol. One victim was found beneath 2 meters of snow. One climber wore a helmet with an integrated Recco.

Another search was performed in Lech am Arlberg. A person was reported missing on the evening of 02.02.2017. A terrestrial rescue with dogs was initiated. A FLIR helicopter and a MOBI drone were also taking part. The search was unsuccessful. New information was available the next morning. Many avalanches were happening in the region. The missing person didn't have an avalanche beacon. It was unknown if he carried a Recco reflector. On 02.04.2017 the search continued. A Recco SAR was brought in from Munich. The search with Recco SAR began at 1700 hours. There was a signal but the search had to be suspended for the night. The next day the search continued at the signal location with Recco R9. The Recco SAR team was on call. The person was found in that location. The accident happened at an altitude of 2371 meters, the signal was at an elevation of 2420 meters. The distance to the buried person was 130 meters.

#### Insights:

- Detailed information on the operating principles of the Recco SAR is important.
- The operations leader needs to be informed on the possibilities and limitations of the system.
- Pilots and air operations managers need to know how the system works.
- There is only a short window of time in which one can use the Recco SAR for the search (between closing the ski area and nightfall).



- There was only contact with one member of the operations management at the heliport.
- When the search is in steep terrain, the coverage changes.
- Exact localization is possible but takes time and training.
- The search area needs to be free of skiers, rescuers, and other people.
- Sometimes reflectors are attached to dynamite so that it can be found if it doesn't detonate. If the reflectors are not attached in the correct place, they are not completely destroyed and therefore can emit false signals.

*File: 20171020-1430-Recco-Andorra.pdf*

### **Helicopter Support for Big Wall Rescue (Charley Shimanski)**

Talks about rescues on big walls in Yosemite National Park. Which technique is used to get the rescuer/load to the wall while the helicopter is hovering? How can you overcome the distance to the wall? Which technique is used when flying out? One possibility is for the rescuer to throw a throw bag with a 1.5-mm pilot line on an 8-mm rope to the person on the wall. There is a weak point in the line so that it breaks if it gets caught or the helicopter has to leave (50-lb. breakaway). The throw bag contains a note that tells the victim what he has to do. The person pulls the load on the helicopter towards him with the throw bag. The load can contain equipment or a rescuer. It is also possible to just throw a rope or to use a telescoping pole. When flying away, the sling that secures the load (for example the rescuer with the stretcher) to the wall is cut.

*File: 20171020-1500-Shimanski Big Walls.pdf*

### **Very Long Line Technique for Base Kumper Rescue by KWRO**

The most base jumpers are found in Lauterbrunnen. There are notices at the jump off points so that the base jumpers inform the base before each jump.

The first example is of an accident that happened on 04.06.2017 at 2000 hours. The accident site was in the middle of the High Nose. The rescue was done by 150 meter longline with Ecureuil B3 HB-ZHY, starting at 2135 hours. A second helicopter illuminated the accident site. At 2315 hours the operation was successfully ended.

Example 2: On 07.27.2017 at 1610 hours. The base jumper jumped off Ultimate and ended up below an overhang. After a recon flight it was decided that a very long rope (360 meters) would be used. Helicopter used AS350B3. This length was chosen so that the pilot could hover above the rock. The patient, however, was already dead. This type of operation can only be chosen if all crew members agree. The crew needs to know what the situation at the accident site is. The time on the HEC is to be as short as possible. The VLL is used to avoid the risk of rock fall and downwash. The crew needs to be trained. The conditions need to be right for the pilot (visibility, reference points). It is difficult to assess the patient's situation. Only a few rescuers can exercise such a rescue. There can be no pressure from the helicopter company. The crew needs to train together. Communication is very important. After the flight a debriefing is held with all crew members. Drones might be an option in the future to assess the patient. If the patient is dead, one could potentially use a different technique.

*File: 20171020-1530-KWRO-Basejump.pdf*

End of Meeting: 1720 hours

For the English Translation: Olivia Cashner