



AVALANCHE COMMISSION REPORT

International Commission for Alpine Rescue



October 18-21, 2017 in Soldeu, Andorra

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Mountain Rescue Association (MRA-USA)

Introduction

The International Commission for Alpine Rescue (ICAR) annual meeting was held in Soldeu, Andorra, the week of October 18-21, 2017. Andorra is a small country in the Pyrenees, bordering Spain and France. This mostly mountainous country with a population of around 85,000 (residents) is the 11th smallest by population and the only co-principality in the world. Andorra is the only country where Catalan is the official language and has not been at war for over 1000 years. Soldeu is a ski town, population 1109 (2012) at 5610'. The top of the ski area sits at 8,465'. The meetings were held at the Sport Hotel Hermitage, the village was mostly deserted when we were there and it was a suitable location for an ICAR conference.

Mountain rescue services in Andorra are provided by the Mountain Rescue Group of the Bombers (fire department – Bombers d'Andorra / Grup Rescat de Muntanya - <https://www.bombers.ad>). Interestingly, it is shared bi-weekly by the Police Corps of Andorra. The original mountain rescue group was created by the government in 1961 and has since then developed into a professional mountain rescue service in order to safeguard its citizens and tourists engaging in summer and winter outdoor sports among its steep, jagged mountains and rugged terrain. Initial specific rescue training takes place in France, lasts for 4 years and include 10 courses lasting between 7 and 21 days each.

The Workshop Day

The theme of this year's congress was "Big Wall Rescue." The Terrestrial Commission arranged the practical session the day before the meetings and the MRA was represented with a station set up by Tom Wood who was assisted by Allison Sheets and Dave Clark. A separate report will be provided on the workshop.

Delegates representing the MRA in Soldeu were Charlie Shimanski (Air), Tom Wood and Dave Clark (Terrestrial), Allison Sheets, M.D. and Ken Zafren, M.D. (Medical), and Chris Van Tilburg, M.D. and Oyvind Henningsen (Avalanche). The delegates are very grateful to our sponsors for the long-term support of this important international exchange.



The Exhibitors

ICAR was again supported by a wide range of exhibitors; Rocksnake, Rescue Center 112, Shiller, Texbor, Tyromont, BCA, Peakze, Aerosize, Aviation Survival and Support, Victorinox, Montura, Kong, Mammut, Bell Helicopters, Exposure Lights, PMI, &H Equipment, Lifeseeker, Pieps, TAS, Ortovox, Arva, Arc'Teryx, Vakuform, Sepura, and RECCO.

A couple of avalanche related notes from visiting the exhibitors are included below.

Trends in **airbags**: carbon cartridges save weight but due to gas import restrictions, the US models are all made available with refillable compressed air, refillable with a scuba tank. Mammut, Arva, and Ortovox all have US specific airbags with compressed air. There's a trend for the balloon to wrap around the head/neck to possibly prevent trauma. The Pieps fan airbag deflates after burial to possibly create an airpocket. The new Aerosize is an airbag in separate pack (looks like a PFD) that can be used with any backpack.

Mammut: nitrogen filled carbon cartridge for Europe and new compressed air with scuba tank adapter for US.

Arva: argon filled carbon cartridge for Europe and new compressed air with scuba tank adapter for US.

Ortovox: nitrogen filled carbon cartridge for Europe; new compressed air with scuba tank adapter for US.

Aerosize: new Polish company with airbag in a PFD like vest that goes over top of any backpack, with two argon cartridges and hybrid venturi valve inflation. Lightest but still in development and not available in US yet.

BCA: refillable compressed air.

Pieps: Fan airbag, fan reverses to deflated balloon to create air pocket, but no studies confirm if this works.



Polish airbag, deflated and inflated

Trends in avalanche **transceivers**: New models available from most manufacturers working on improving user interface, search strip width, signal acquisition time, signal retention, signal overlap problem solving, marking function. Nothing presented as “revolutionary new”



Trends in **shovels** – there are an extreme number of shovels available from the different manufacturers. Some can be used as hoes, some can be converted to an ice axe, some have the avalanche probe inside the handle, some are better suited for snow observation work, some are light, some are heavy, some have a t-handle/half t/D/half S..... It seems that it can be difficult to select a shovel that is the most appropriate for mountain rescue work. To assist in the selection there is a new standard just introduced by UIAA and selecting a shovel that conforms to this standard seems appropriate: http://www.theuiaa.org/documents/safety-standards/UIAA_avalanche_rescue_shovels_156_final.pdf

Trends in avalanche **probes**: The manufacturers provide a wide array of avalanche probes – they vary in length (240-330 cm), assembly (ease and durability), material (carbon/steel), thickness, tip construction, bendability, marking, etc..... UIAA is currently working on avalanche probes in order to establish a standard similar to that of avalanche rescue shovels and that will no doubt make it easier to select and recommend avalanche probes better suited for avalanche rescue work.

RECCO is continuing the release of its long range receiver this year – to be tested at a dozen or so areas in Europe this winter with expected release to North America next year. This is a helicopter mounted RECCO SAR detector. This detector can also be used to search for missing subjects in searches unrelated to avalanche missions. RECCO is considering the SAR possibilities of this device if the reflector usage and proliferation amongst other user groups was greater. RECCO is also marketing heavily to mountain bikers and hikers.



Avalanche Commission



President of the commission **Dominique Letang**.

Dominique is an IFMGA guide and has been the president of the avalanche commission since 2011. He is the Director of the French Avalanche Association (ANENA) since 2009. The vice presidency of the commission is currently vacant.

Dominique opened the commission with a review of the commission's work over the last year, his involvement in the commission and his attendance at several meetings of the ICAR Board and the avalanche working group throughout the year.

Manuel Genswein provided an update on the **working group** meetings and progress through the year. The Mountain Safety Knowledge Base has been renamed Mountain Safety Info. The goal was to have a complete set of illustrations and translations finished by the fall 2017. This has been accomplished and there is a strong desire to freeze the work and publicize and implement it now. It currently sits at about 160 illustrations in almost 20 languages that are completed. The working group has started a new topic "Organized Avalanche Rescue." The working group in the avalanche commission met for 2 days prior to the conference to finalize the current illustrations and languages. There were about 12 topic experts present and another 30 had collaborated in advance on a new platform called Basecamp which most people felt was a good tool for getting such a large group to work well together. Several organizations have signed a memorandum of understanding (and now ICAR has also) to be part of this development process to cover best practice in mountain rescue based on qualitative and quantitative data. After ICAR signed the MOU, Manuel has been approached by many ICAR member organizations that would like to be part of the working group. The material will be commercially available on a subscription basis to organizations around the world.

Additional information on the progress of the working group was presented by **Fred Jarry** of ANENA. The working group works for long hours when it meets – typically 8am to 11pm.

May 2014 - start by appointment from the ICAR avalanche commission

May 2016 - field meeting stubai – slalom probing and conveyor belt focus

Summer 2016 - implement database

October 2016 – presentation to icar – mountain safety knowledgebase concept

Winter 2017 – implementation of translation and fine tuning of illustrations

May 2017 – field meeting in Chamonix – improve existing content – RECCO consensus presentation / new techniques – 1 day dedicated to MSKB with ICAR/IFMGA/UIAA/ENSA/SLF. 1 field day with new topic of pinpointing + decision to freeze content at end of 2017

October 2017 – Soldeu – last revision of existing content, implementation of translation, and work on new topic "avalanche rescue organization"

Today the workgroup is under ICAR umbrella – the workgroup might move under mountain safety workgroup that would be under ICAR/ENSA/IFMGA/SLF/UIAA collective umbrella, this is yet to be determined.

New members introduced

Madrid mountain rescue, US ski patrol foreign division, Bosnia-Herzegovina mountain rescue

1 minute of silence was observed in memory of the victims of Italian avalanche accident at Hotel Rigopiano where 29 people died - https://en.wikipedia.org/wiki/Rigopiano_avalanche

There are **no new recommendations** from the ICAR Avalanche Commission this year

Avalanche accident reports

Italy

Average 20 people die, mostly in center of Italy – some in the north. Of note several accidents involve 2+ fatalities. Last season there were avalanche accidents as early as late October. October 22, 2016 – 4 victims on a N aspect, soft slab on facets, climbing. October 29, 2016 – 2 victims on a SW aspect during a warm afternoon on a steep slope and small slab, climbing. Both found 3-4 days after the accident in crevasses with RECCO under 2-3 meters of snow.

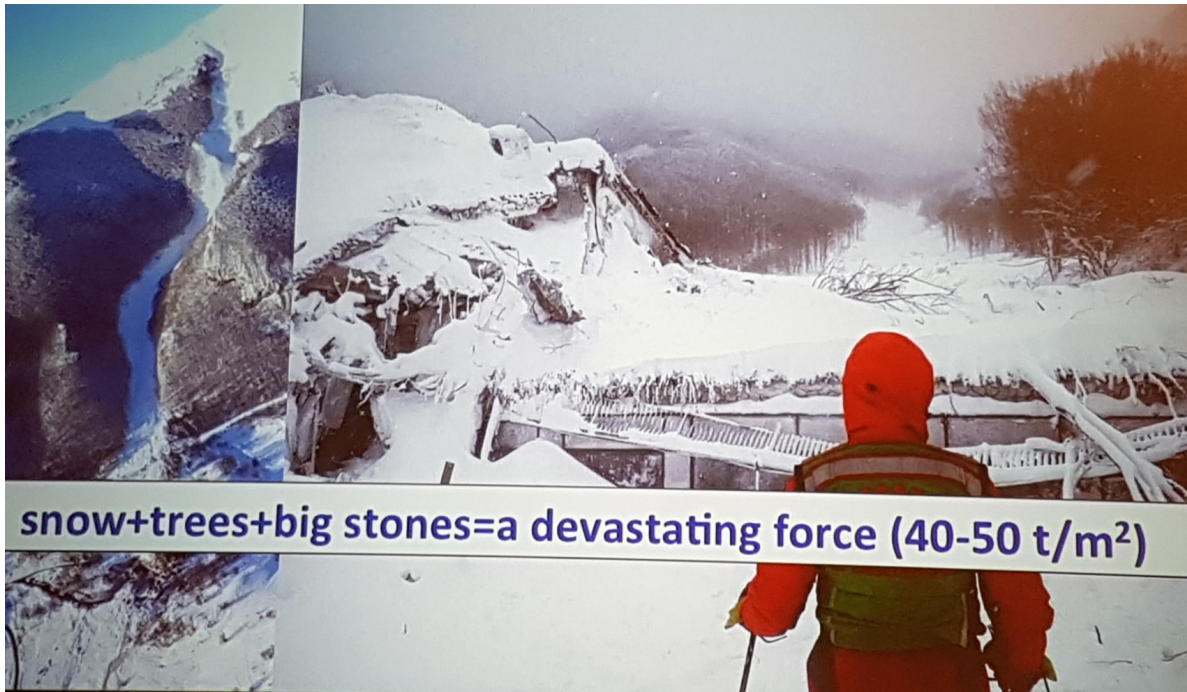
A case study was presented discussing **legal consequences of human triggered avalanches**. 3/2/2017 - Mont Blanc off piste accident in a closed area. Many skiers in the same couloir skiing on top of each other, for many the couloir was too difficult to travel efficiently in. 3 people died, 4 different languages on the scene created difficult communications, 20-22 minutes for rescue (3rd victim unburied). Many interesting legal questions: a German mountain guide took his clients into a closed area on the second day for his group and above the skill level of his clients, a ski instructor took his class into the area. The investigations are still going on, but general remark was that in Italy “if you cause an avalanche that is possible to bury someone – subjecting someone to danger” the law is against you and there are increasing legal consequences.

Of interest in Italy - 35% of avalanche accidents had a mountain guide.

January 18, 2017 **Hotel Rigopiano** – 29 victims. Slab width 250-400m, length 250m, 2-3m deep, path 1km+. It had snowed more than 2m in 2 days, it was very cold with high winds. Reported snow drifts in start zone 4-5m tall. The hotel was in a path with 60-90 year return. Hit the hotel, turned it off its foundation and buried it. Most victims were waiting in the main hall to be evacuated from the hotel due to earthquakes happening in the area when the avalanche hit. This was a very challenging rescue, there were many agencies involved and there were difficulties with coordination. More than 100 rescuers experienced difficult travel and weather conditions; snowing hard and increasing avalanche danger. They used special intelligence tools (now only used against terrorist) to find smart phones. This was a hand-held portable cell phone ping detector.

Some observations:

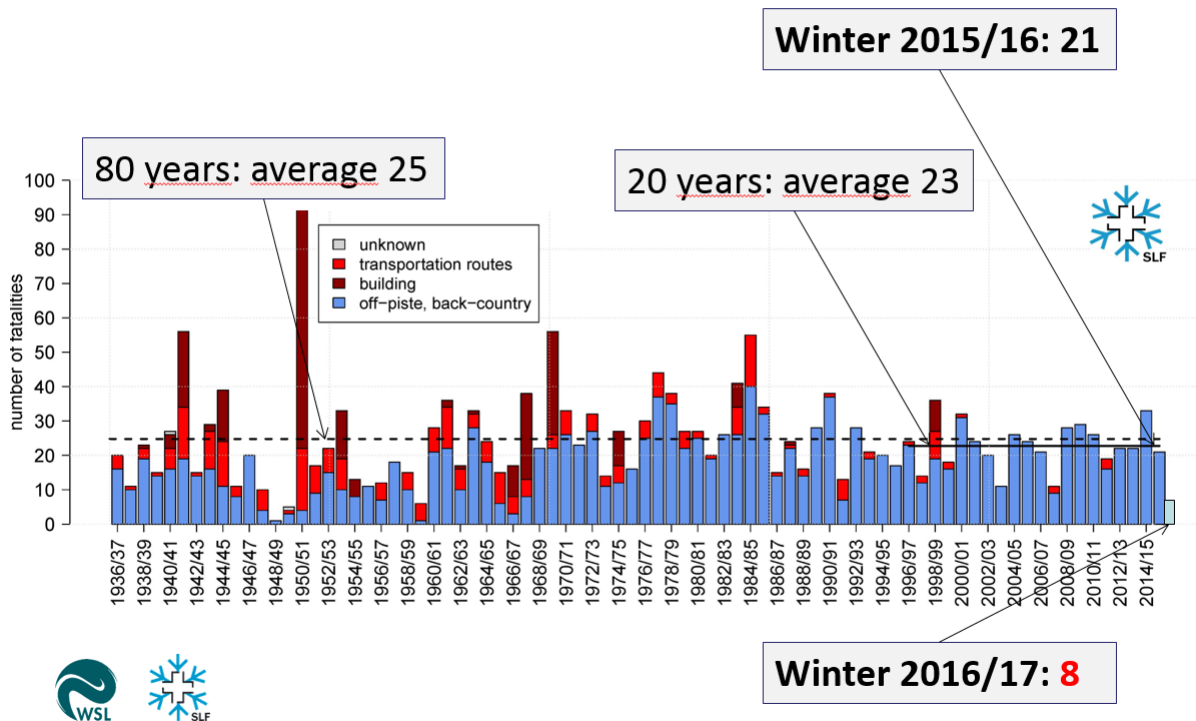
- Hotel located in an avalanche path with a history of massive avalanches
- Earthquake and aftershocks at the same time – emergency services overloaded, hotel isolated
- Responders had to ski in at night creating a delay in rescue, calls for rescue initially believed to be a hoax or confused due to no direct line between emergency operator and reporting party
- 40 people in the hotel – 29 died
- very difficult to search in buildings unless practiced
- regular practice with nearest neighbor and all local emergency agencies is very important for efficient and effective response in large scale incidents.
- A handheld version of Lifeseeker cell phone detector (IMSI catcher) was used to localize a cell phone
- Telephones were down, but internet services worked – text via WhatsApp got out.
- Snow, trees and big stones in debris created devastating results – 7 feet of snow on top of hotel – cars thrown around like toys.
- Snowplow broke day before. 2m of snow and debris on the road made for difficulty getting road plowed
- There is no time to waste, a quicker response would most likely have saved someone
- Rescuers want to have access to a helicopter anytime, anywhere, and that can fly in any weather
- Some rescuers were unprepared for the elements.



Switzerland

On average 25 fatalities per winter. Big fluctuations from year to year. 20 year average down to 20 people. Last winter there were only 8. Similar to the USA they are asking why? Most likely reason is lack of snow last year. In Switzerland they are thinking about how to provide the historical data for people to give them an idea about what has happened already on a particular slope.

Avalanche fatalities since 1936/37



Norway

Season was characterized by a lot of very strong winds. Two fatalities only.

The first was in an accident involving a group of 4 with two people buried. First subject uncovered quickly and survived, second subject in a terrain trap (river) under 5.3m of snow. Red Cross conducting training in the area conducted rescue. Located with an airpocket and CPR was started. Taken to hospital and ECMO started. Unfortunately, brain damage too big and person died the next day.

The second fatality was from a fall causing trauma after a cornice collapsed that the victim was standing on.

Red Cross has of late focused on avalanches that affect infrastructure and they are developing and adapting training in relation to this. Most of the training they do now is for skiers and recreationalists



Poland

Kuba Hornowski, Kuba.hornowski@topr.pl, would like to be contacted by anyone that has a case study of a victim located (buried) outside visual boundaries of an avalanche. Questions he is asking: When to assess if this is possible? Where do you put the flags? When do we put the flags? How do we assess the added distance (outside visual – increased search boundary)? Is it true that untouched snow is elevated? Don't know where that comes from. Is there an apparent toe that is different from the real toe? Should we probe in untouched snow outside the visual to determine if the untouched snow has avalanche debris under it? ICAR recommendations to not say where / when to put the flags. How do we establish this and how do we teach and who do we teach about this? Or alternatively if there is no real only theoretical evidence of this being possible, then maybe we should not?

It was pointed out that in Switzerland a subject was located 10 meters outside an avalanche boundary – he was buried and survived in 2005.

Spain

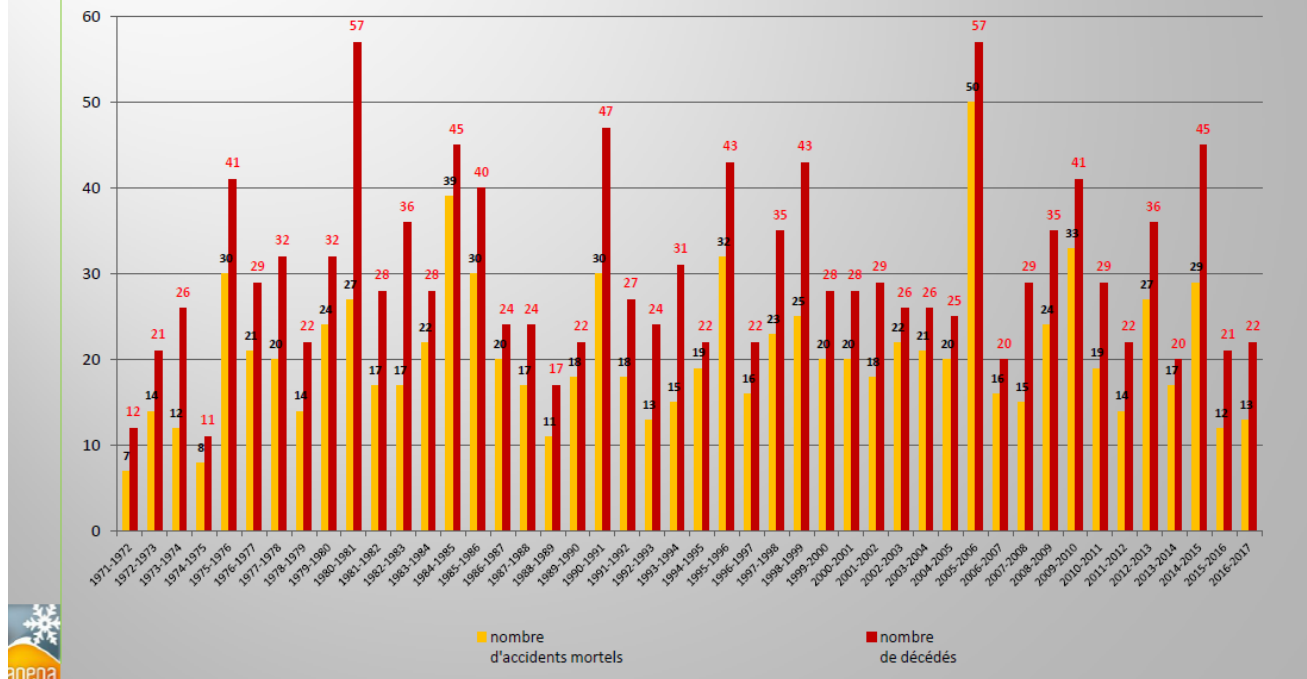
12.12.16, accident, 1 died from trauma from an avalanche while going up in a gully. Avalanche danger rated as low, but with a specific warning that some slabs could be present on N facing aspects. Start zone in thinner part of the snowpack near a rocky outcrop, most likely climber triggered. Climber on Gra de Fajol, in the Eastern Pyrenees NNE aspect. Rescue by MR of Catalunya. There is an investigation pending.

France

One of the least dramatic years since 1970. 114 people caught. 13 fatal accidents vs 22 fatalities. On average 30 fatalities annually the last 46 years. This was attributed to a short winter season, warm conditions, no real snowpack before mid January, and early melting.

One of the least dramatic year since the 70's

- 114 people caught
- 13 fatal accidents (46 years average = 20)
- 22 fatalities (46 years average = 30)
- 10 skitourers
- 9 off piste skiers or snowboarders
- 3 alpinists



A case study was presented where 4 people died while off piste riding during a ski course with an instructor. There was a massive response with over 200 people helping within short time creating a very complicated rescue situation. The avalanche debris stopped at the wall of a dam and created the possibility of deep burials. This was coupled with incorrect registration of students in the ski class which created a double registration of students and thus a time consuming search scenario with a very prolonged effort to try to find a person that was not missing.

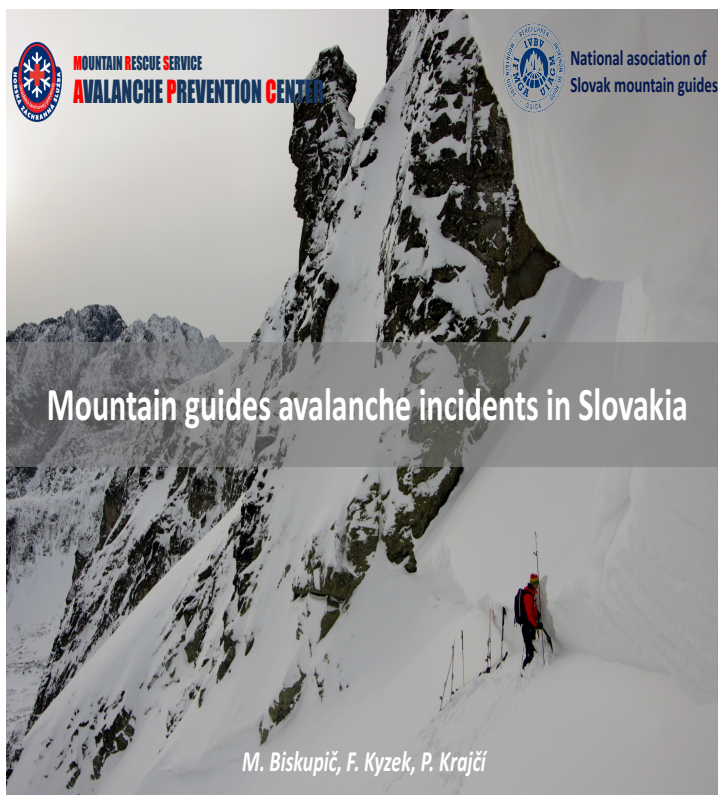
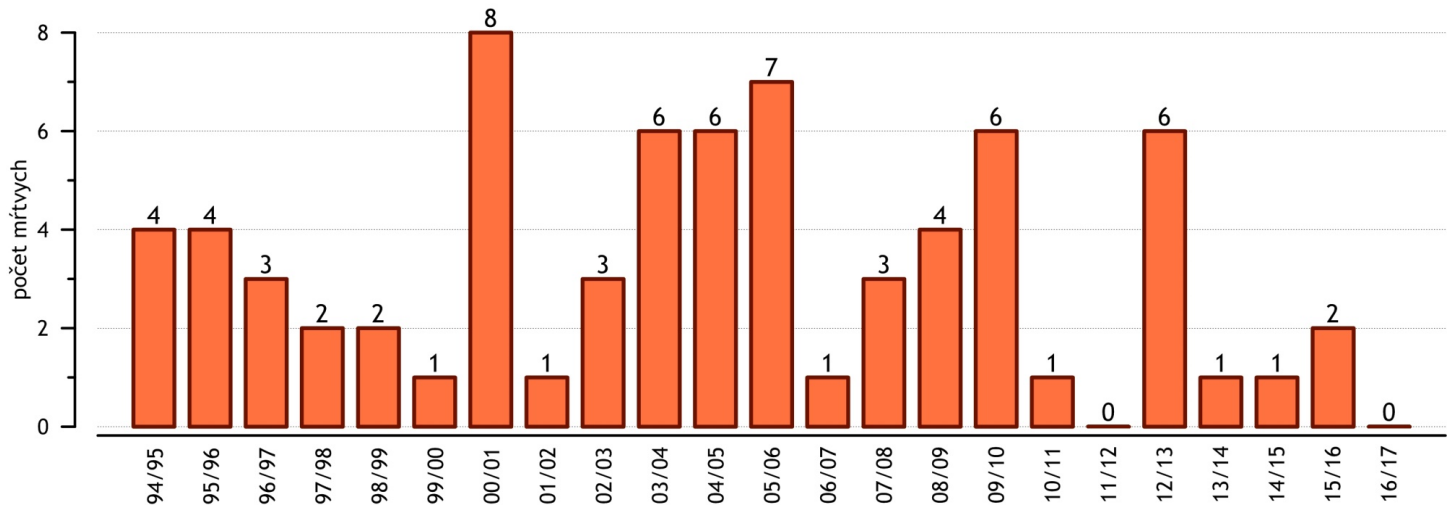


Another case study from Tignes where there as an in-bound avalanche release. They dodged the bullet on this one as the avalanche happened on a blue run where there were at least 100+ people. There were at least 33 people caught, but only 2 injured. It was a loose snow avalanche with 40-100cm deposit. Ski patroller dogs, RECCO, transceiver, and probe line searches in the debris for 2-3 hours before area was cleared.

Slovakia

Several times with high danger level and they had 10 recorded incidents, mostly during considerable danger. In one accident in the Tatras there were several groups traveling on top of each other when an avalanche was released. One person was buried, 10 minutes – recovered alive.

They had 0 fatalities last season and they have on average 3-4 and are left asking why no fatalities in a snow rich winter. The presenter believe that there were many contributing reasons.



Mountain guides avalanche incidents

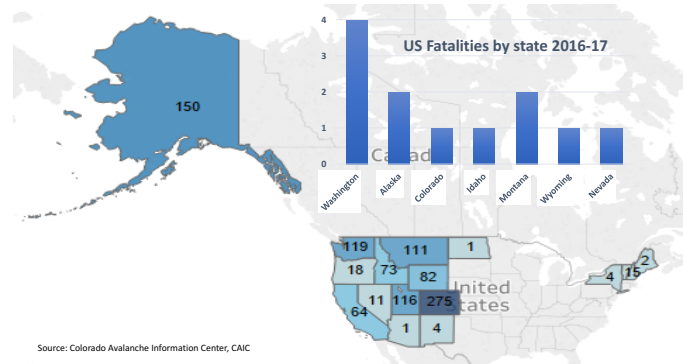
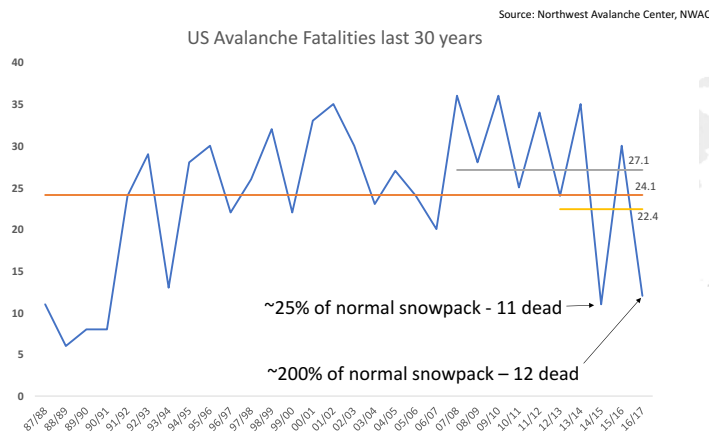
A presentation of the data collection of the avalanche incidents involving mountain guides in Slovakia. Presenter stated that the research could not be 100% accurate as not all information available as not a proud moment for mountain guides and that it carries or has carried a stigma to not talk about this openly.

1998, 2013, 2014, 2014, 2015 accidents were presented.

Data supports several contributing factors to avalanche accidents involving mountain guides: Guides exposure acceptance x client's motivations x client's disobedience of directions given by guide (communication problem) x the month of March (statistically highest accident month). (Note: very interesting how many times it was reported by the involved guide that the reason for the accident was that the client did not follow direction of keeping the proper distance – seems to be a very dangerous risk mitigation / consequence prevention means.)

The United States

TAR / National Avalanche Center: The winter of 2016/2017 was impressive. From hurricane force winds in California to single digit temperatures in the Cascades to record snowfall in Idaho to rain-on-snow in Wyoming, it wasn't boring. Despite the unusual winter and repeated atmospheric river events which created several periods of widespread high and extreme avalanche danger, the number of US avalanche fatalities ended at about 50% of average at 12 (maybe 13 depending on an ongoing investigation in Olympic National Park). Reports showed that backcountry tourers (3) and snowmobilers (4) were the largest fatality group last season, following the trend of the last 10 years. Of note is that UT, WY, and CA did not have any fatalities last year.



The question was posed – why did we have 50% of average fatalities in a 200% of average snow year? Experts in the USA have attributed this to many factors: Improved safety equipment, Social media campaigns, Avalanche education, Safety/awareness courses, Advisory issuance, "Less persistent problems", Luck. It might seem that the folks involved in education really believe education has made a difference, the forecasters really believe the forecasts have made a difference, the equipment manufacturers.....and so on. However, we all must be doing something right: "If our fatality rate had stayed steady while the use increased we might well expect over 200 U.S. avalanche fatalities per winter!" – a statement by The National Avalanche Center

According to Dale Atkins and Brian Lazar of CAIC: At least in Colorado, we had fewer avalanche deaths than the long-term average, but we didn't see any significant change in the number of people caught. There were many close calls, including **8 full burials where the victim survived**. If even half of these close calls went the other way, Colorado would have near the average number of avalanche deaths for a season.

I found that accident/incident reporting have been classified according to "type of avalanche" and not the recent focus on classification according to "avalanche problem". It is thus difficult to analyze any trends with any statistical significance the relation to why there were fewer fatalities in low and high snowpack years, at least it is difficult to fully understand the correlation of avalanche problem to accident data. Only CO and UT have been collecting (and publicizing) data on accident by avalanche problem. They are finding that most accidents happen during PS and DPS problems. This seems to make sense as these are the problems that pose the most difficulty for most backcountry users.

Note to Dale Atkins – On data collection – please send email to Fred Jarry on continued international avalanche accident / incident data collection. Fred will distribute link on how to collect data and Dale's contact information and also put in the minutes so that this important work is continued.

An **educational board game** for kids about avalanches were presented with QR codes.

Snowplak – new snowshoe type – was presented by ANENA <https://vimeo.com/239636096> - interesting concept that is compatible with most boots while using crampons.

Garbisch Gebhardt – presented in a joint meeting with terrestrial and avalanche commissions the Mountain Safety Knowledgebase timeline and the involvement of ICAR. All commission presidents have agreed to the memorandum of understanding for the “**Mountainsafety.info**” and to release MSI for the work already completed by the avalanche workgroup in the avalanche commission.

Gebhard: sometimes you will have best practices for everybody, but we must allow for more best practices to account for different situations. **Genswein**: it is absolutely possible to have several techniques that fulfill or solve the same problem. More than one solution to the same purpose, this is acceptable as long as they do not have a critical safety issue or a critical user error intolerance

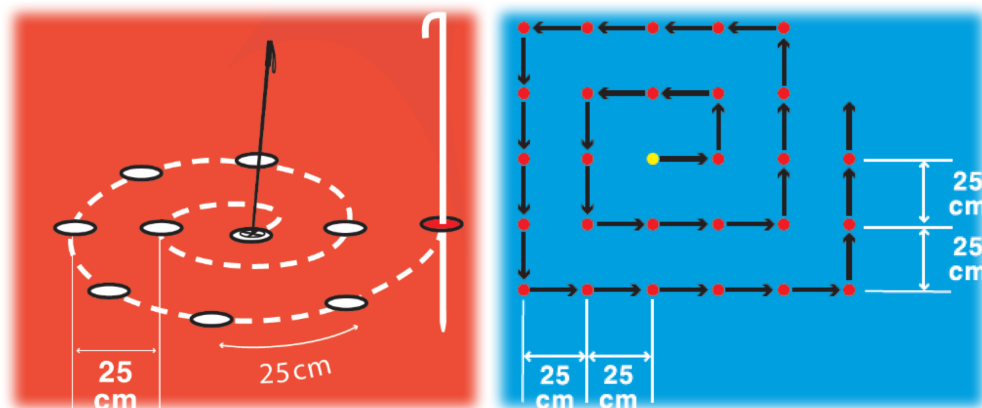
This brief by **Gebhard and Genswein** was followed by three joint commission presentations that will be covered in the terrestrial commission report.

- Rappelling Techniques on big walls by Rizotti CNSAS
- Big wall caves, systems for rappelling and recovering on very big caves by A. Sbisà CNSAS
- Rappelling systems with Cancon stretcher on big walls in canyons. By Rossati CNSAS

Of interest for the cave rescuers – CNSAS has a rescue handbook they will share on pdf if you apply here: <https://formazione.cnsas.it/download/handbook/caving-rescue/>

Pinpointing after a search with electronic means: field testing in order to optimize technique.

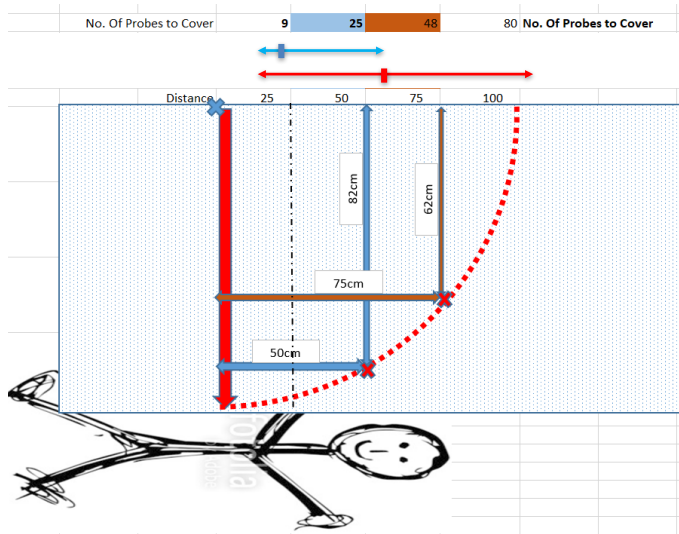
This work comes out of the avalanche commission working group and field testing in the spring of 2017. Using modern search devices during avalanche rescue, search times for the first three phases of the search has been drastically reduced. However, while pinpointing (spiral or square) rescuers often spend a considerable amount of time until they confirm a find by a probe hit. Early findings indicate that it might be beneficial to initiate the probing spiral with a larger spacing to speed up the time until a probe hit is achieved. Only for a minority of cases, the currently applied high-density probing pattern might need to be applied:



Some preliminary findings are:

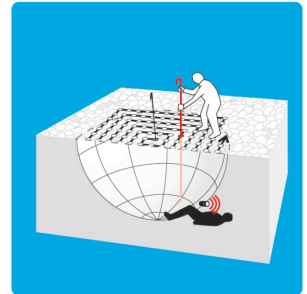
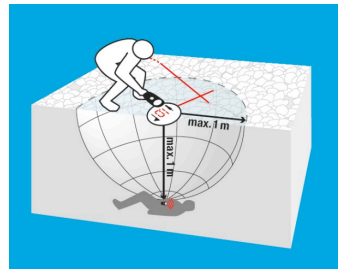
- More testing to be done to verify first impressions.
- Reminder to rescuers: display number is a distance and not burial depth
- Pinpointing times are greater than signal to fine search time
- We need to analyze and evaluate search characteristics to conclude on most optimal probing pattern in order to reduce time to probe hit

Fieldline Radius and Number of Probes



General

Time per probe hole	4sec			
	Off set	No of probes	total time	additional time for this circle
1st	25	9	36	36
2nd	50	25	100	64
3rd	75	49	196	96
4th	100	81	324	128
5th	125	121	484	160



Prevention

Avalanche risk perception in Andorra. Presentation on avalanches in Andorra highlighting the increasing use of backcountry/sidecountry but lack of training, equipment among the general population.

Backcountry Zero. Avalanche prevention campaigns with the help of commercial sponsors to produce blogs, posters, videos, and social media. A good reference is www.backcountryzero.com from Teton County SAR “Established in 2015, Backcountry Zero is a Jackson Hole community vision to reduce injuries and fatalities in the Tetons. Backcountry Zero is a four-season, cross-sport, community-led program created by the Teton County Search and Rescue Foundation (TCSARF) to inspire, educate, collaborate, and foster leadership in order to develop and heighten awareness for safer practices in the backcountry.

Backcountry Zero aims to cultivate a culture among user groups with a common language of principles that guide safer, enhanced decision-making and travel in the backcountry. These aims are accomplished through working with the community (guides, teachers, mentors, retailers) to create program touchpoints, and through crafting and implementing events, educational opportunities and workshops, granting programs, and shareable multimedia.”

Stephanie Thomas of TCSAR presented the influence of Backcountry Zero on avalanche education and how they are aiming at reaching a wider audience and creating a safety culture with videos in theater, podcasts, posters on trams, logo/website, cooperation w/resort, etc.

The **odor of the human breath can drive avalanche search and rescue dogs to discover a buried victim** under the snow. Dog rescuer and researcher highlighted the role of human breath. A study showed that even with a buried person in compacted snow, human breath seems to be more important than human scent. Research presented by S Diverio of Italy.

La Chamoniarde - <https://www.chamoniarde.com/en/#>

Association for mountain rescue and risk prevention in the Chamonix valley. They have a very impressive risk prevention and education program including training programs for different user groups, videos for education, current mountain condition reports, trip reports, planning tools, and weather information, and they also run interagency and intercountry training. They operate 5 avalanche rescue practice stations (transceiver parks) and also conduct mountain rescue in the valley. The association will help host ICAR 2018.



Triage strategies, a concept for optimizing avalanche rescue strategies by Paal and Genswein

We assume shortage of resources to save buried persons. Do we start CPR or not with patient found in cardiac arrest? **Paal and Genswein** used a Monte Carlo simulation in order to answer this question because there is not much data out there to guide us.

Paal started with medical definitions, known outcomes, and assumptions. Brain can go without O₂ for 3-5 minutes without damage. A study showed 6% out of people resuscitated had good neurological outcome – Pittsburgh urban cardiac arrest study. In avalanches – CPR started on scene and buried more than 35 minutes there exists no record of survival. However, good neurological outcome is possible if immediate CPR and ROSC (return of spontaneous circulation) is achieved. Hypothermia before hypoxia is important, but it rarely happens in an avalanche. Assumption is a normothermic cardiac arrest. Question is: should we start CPR and for how long?

Assumption: shortage of resources: 1 rescuer, 2 victims. Assumption: Greatest good for the greatest number. For optimized survival chances do you:

1 – once you start cpr don't stop, for how long?

2 – don't start cpr at all

Monte Carlo simulation conclusion – limit cpr to approx. 5-7 minutes – shortage of resources determines how much you can do on each patient → do CPR on pt 1 and then move on to pt 2. With VF on site, stay with person 1 as good outcome is possible.

Both **Paal and Genswein** stated that this is model 1.0 and that there is lots more work needed.

The talk reinforced that avalanche survival with complete burial, the best outcomes are for bystander/companion rescue with short burial time and quick return of spontaneous circulation. Fatalities directly correlate to duration of burial and presence of an air pocket, and if a professional rescue team is called in, it probably is too late

MedCom lectures particular to avalanche

MedCom attempting to start an avalanche and trauma registry. Difficulty in getting data from hospitals. They need hospitals to input data into registry and are facing problems with ethics in regards to patient details.

Dr. Sheets presented a paper which reviewed 20 years of avalanche fatalities in Colorado. She found 29% of fatalities were caused by trauma of n=110. This is higher than what was previously reported (Boyd reported 24% trauma and other previous studies reported 5%).

Brugger presented a study in which recommended starting CPR in the hole prior to complete extrication of a victim. CPR can be started prior to extrication if patient is found supine or sitting. This means that CPR can be started about 4 minutes earlier than if waiting for complete extrication. If prone/head down, complete extrication needs to be completed prior to starting CPR.

Summary

ICAR 2017 provided demonstrations of big wall techniques and has been documented by Topograph Media <http://topographmedia.com/icar-2017-andorra-part-1/>

First part highlights

1. Stein Moller, Norwegian Alpine Rescue Group **Super Long Line Helicopter Pick-off**
2. Prof. Dr. Volker Lischke, Bergwacht and German Red Cross **Pelvic Injury Stabilization**
3. Lana Donlagic, Dr. Med, Klinikum Klagenfurt am Worthesee **Suspension Trauma**
4. Christoph Cabarrot, Unit Leader, Bombers d'Andorra **Search Dog Presentation**
5. Laurent Arnaud, PGHM, and Pierre Bertolott, CRS Instructor, **Big Wall Patient Immobilization**
6. Tom Wood, US MRA, **Mono Pod in Edge Transition**
7. Ennio Rizotti, CNSAS Instructor **Big Wall Rapelling Techniques**
8. Andrea Sbisa, CNSAS Instructor **Litter Operations in Waterfalls or Caves**
9. Klemen Voluntar, Slovenian Mountain Rescue Assn. Instructor **Pick Off under Overhanging Rock**

<http://topographmedia.com/icar-2017-andorra-part-2/>

Second part highlights

- 1) Patrick Fauchère, President ICAR-AIR Switzerland, 0:40 **Air Rescue President's Report**
- 2) Charley Shimansky, Air Rescue Delegate CO USA, 1:59 **"Offset Technique" Training in Yosemite**
- 3) Dan Halvorsen, Air Rescue Tech Advisor Norway, 5:27 **Base Jumping in Norway**
- 4) Gebhard Barbisch, President ICAR-TER Austria, 9:04 **Terrestrial Rescue President's Report**
- 5) Matthias Hofer, Climbing Guide South Tyrol Italy, 10:25 **Hochferner Search in South Tyrol Italy**
- 6) Dr Fidel Elsensohn, President ICAR-MED Austria, 13:28 **Alpine Emergency Medicine President's Report**

- 7) Dr Hermann Brugger, Institute of Mountain Emergency Medicine Italy, 14:45 **Suspension Trauma Research**
- 8) Marcel Meier, President ICAR-DOG Switzerland, 17:55 **Dog-Handler's Sub-Commission President's Report**
- 9) José Javier Chamorro, LifeSeeker Spain, 18:53 **Demonstration of the LifeSeeker System**
- 10) Dr Iñigo Soteras, Chief Medical Officer Hospital de Cerdanya Spain, 22:05 **Closing Day Demonstrations by the Bombers d'Andorra**
- 11) Franz Stämpfli, ICAR President Switzerland, 23:41 **Final Remarks from the ICAR President**

The conference days contained many valuable presentations for us as rescuers, the ones in the avalanche commission have been summarized above. Please contact either of your delegates for further information. The other commission delegates are preparing separate presentations. The minutes of the commission meetings will be found here:

<http://www.alpine-rescue.org/xCMS5/WebObjects/nexus5.woa/wa/icar?menuid=1077&rubricid=257>

The Assembly of Delegates meeting will be presented in a separate report.

Upcoming ICAR congresses:

2018 October 17-20 Chamonix, France
2019 Zakopane, Poland
2020 Thessaloniki, Greece

Respectfully Submitted,

Dr. Christopher Van Tilburg
Hood River Crag Rats

Oyvind Henningsen
Everett Mountain Rescue Unit

