

ICAR 2022 Avalanche Commission Report

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The International Commission on Avalanche Rescue kicked off on October 12th in Montreux, Switzerland. It had been three years since the last in-person conference, and it was nice to see new faces and old friends.

The first day was a practical field day, hosted by the Avalanche Commission (AVACOM) and held in the mountains of Jaman above Montreux. The Col de Jaman sits at an elevation of 4,961 feet above sea level, while the nearby Dent de Jaman peak is 6,152 feet above sea level. Since it was early in the season and low elevation in the Swiss Alps, temperatures were cool, but snow was absent. This limited the “avalanche-specific” field demonstration opportunities.

A Recco long-range receiver demonstration was conducted by Air Zermatt. The demonstration consisted of three “victims” hidden in the trees in the valley below the field area, with their locations unknown to the helicopter search crew. Radio communications, mostly in French, were broadcast for the audience. Of particular note was the obvious transect/signal acquisition search patterns, followed by the directional location of each victim. Upon location, the victims

stepped out of hiding and popped smoke to confirm their location, which was a valuable visual aid for the audience. Recco now has eleven helicopter-based long-range receivers in North America. These receivers include the Mountain Rescue Association (MRA) as well as the team states of Alaska (Alaska



Department of Public Safety), California (California Highway Patrol), Colorado (Colorado Highland Helicopter), Montana (Two Bear Air), Utah (Utah Department of Public Safety), Washington (Snohomish County Helicopter), and Wyoming (Teton County Search and Rescue). MRA regional and/or state representatives should consider contacting those agencies/entities for training and establishing avalanche mission deployment protocols and procedures. Representatives should also consider contacting those agencies/entities for potential terrestrial

search missions, as Recco reflectors are now becoming more common in four-season apparel and equipment.

Swiss Alpine Rescue also provided a search dog demonstration. While not avalanche specific, the “Swiss four-phase” method is well-known throughout the avalanche search dog community in the United States.

The next three days were spent at the Montreux Music and Convention Center with our respective commissions. Stephanie Thomas was elected as president of the AVACOM last year and was serving in her new role at the conference. It was a welcome change to have organization and leadership after the last few conferences. There was a renewed energy and interest in getting things back on track.

The first item on the agenda was accident reports from the attending countries. It was found that accidents were down last season, with the theme being warm and dry winters leading to less snow/participants. This led into a discussion about how to expand the accident reporting and make them useful, rather than simply a hashing of grim statistics. Stephanie distributed a “standardized” accident report format prior to the conference, although only about half the reporting countries followed the format. This was likely due to the late distribution and without context as to the reasoning for the format. Accidents and fatalities across reporting countries continue to be most common at the “Considerable” hazard rating (or the corresponding country equivalent), consistent with what we tend to see in the U.S. One of the goals of the standardized report format should allow for more empirical analysis of this data within the Avalanche Commission going forward. Anecdotally, other countries seem to struggle with the same “Considerable is the New Moderate” mindset as the U.S. There will more on this below.

The accident reports and ensuing discussion also brought up the topic of where the AVACOM sits in regards to forecasting and avalanche centers. Avalanche forecasting and accident investigation have a different role and scope vs. mountain rescue. However, “prevention” should ideally be a common theme across both organizations, as evidenced by the Considerable observation above. One use of the more empirical statistics in the country reports may be to inform and improve the messaging used in avalanche forecasting. How best to engage forecast centers in the U.S. may be a future (current?) topic for the MRA to consider, and the ICAR AVACOM should be an important venue for MRA to observe how other countries are doing it, (effectively or otherwise).¹

When AVACOM last met in Poland, we decided on four areas we wanted to focus on as individual working groups: Prevention, Partnerships, Recommendations, and Common Language and Statistics Workgroup. We were able to continue work this year and spend time in

¹ RTC Note: MRA places a premium – and rightfully so – on education and prevention; the rescue we never have to do is the best one for the patient. There may be an opportunity for MRA to be a leader in this initiative, particularly given Stephanie’s role with Backcountry Zero and as AVACOM President, should AVACOM endeavor to coordinate more with avalanche forecasting centers.

breakout sessions. The first area, Prevention, focuses on public outreach and prevention. Partnerships looks at working with companies and other organizations to help with avalanche rescue issues (see Joe Obad's talk below). Recommendations looks at rescue techniques and equipment that the AVACOM commission will recommend as best practices. Lastly, Common Languages and Statistics looks at how to bridge the language and culture barriers in reporting accidents. These four groups will meet throughout the year and work in their respective areas.

Ryan facilitated the AVACOM Recommendations breakout working group. Many of the recommendations are dated, with the most recent update from 2015; hence, a single breakout session was not going to be sufficient to review all, or even most, of the commission's recommendations. The breakout group agreed that the best path forward would be to convene an AVACOM subcommittee over the next year to review each of the recommendations, prepare updates where appropriate, present to AVACOM for preliminary approval prior to the ICAR 2023 conference, and then present to the full assembly of delegates. In general, it was agreed that recommendations should be simple, clear, and easily translatable in multiple languages, using graphics/illustrations wherever possible. This follows with the MountainSafetyInfo (MSI) initiative approach (addressed separately below).

There was also a discussion within the breakout group about whom the audience of AVACOM's recommendations should be – mountain users, mountain rescue teams, or both. It was generally agreed that there will be some overlap and recommendations that apply to both; but, that there should be some clear recommendations of best practices for mountain rescue teams and a separate set for mountain users. This again came back to MSI, which is likely the better venue for the mountain user audience, so they do not get lost or mixed up with rescue-specific recommendations. AVACOM will consider a "recommendation" to adopt and endorse the MSI material. There will be more to come during the year on this topic. For the mountain rescue team audience, these recommendations will be particularly important for new teams/entities joining ICAR, where they have a resource to review for what ICAR considers as best practices.

Finally, the group agreed that AVACOM should make a new recommendation regarding the implementation of an incident command structure (ICS) for organized avalanche rescue response. Although most country teams already follow some sort of ICS, the AVACOM recommendations are presently silent on the topic, and everyone agreed a new recommendation was warranted.

Michael attended the breakout group on Common Languages and Statistics. The idea of an international avalanche accident and incident database has been the dream of many people over the years, but it has been an elusive beast. One of the biggest barriers to this has been the lack of standards and language around the idea of what constitutes an 'accident'. While the loss of life or a serious injury is agreed upon, what constitutes a near miss? Another theme was on what do we want to keep statistics? Avalanche rescue is usually a low occurrence event for most teams, but if data can be gathered for an avalanche rescue in such a way that it can be aggregated globally, we might be able to infer things much quicker. This can help answer the

questions of what techniques and equipment are teams using for avalanche rescue, and what was the outcome?

One of the more notable talks was by Joe Obad of the Canadian Avalanche Association about the recent convening of equipment manufacturers and avalanche professionals to discuss transceiver electrical interference. A small workgroup got together 20-21 September 2022 in Salt Lake City, Utah with the initial stated goal to hone in on desired behaviors and outcomes; which the working group identified and Joe summarized briefly but indicated required some more work before formalizing. The working group invitation list was originally kept small to encourage more dialogue, but the group would be expanding and he could be contacted directly about joining (jobad@avalancheassociation.ca).



The current recommendation from manufacturers is that avalanche beacons should be 20 centimeters from other electrical devices when in send mode and 50 centimeters when in search mode – both of which AVACOM attendees noted is becoming increasingly difficult for rescuers. Between cell phones, radios, GPSs, airbags, etc., interference is a significant concern. It was noted that there have been several recent airbag design updates specifically to address the beacon interference issue.

Following on MEDCOM's research and recommendations described below, Ryan identified a potential AVACOM research opportunity (which could be conducted jointly with MEDCOM and DOGCOM). AVACOM has recommendations regarding training, but there seems to be little data about the effects of "simulated burial" on training patients – meaning, those individuals that are voluntarily buried as part of avalanche search drills – and what an acceptable amount of time for a training burial might be. One approach could be to monitor burial volunteer heart rate, oxygen saturation, and core temperature while buried to recommend a time limit/threshold within which an individual should be subjected to burial. At least one manufacturer has conducted similar medical monitoring during product development.² Product vendor Cosinuss has a Bluetooth in-ear monitor for these physiological data points, so there is

² Black Diamond Equipment as part of their Avalung development, but possibly others.

potential for real-time data collection correlated against burial time. Perhaps not a high priority for research, but this seems to be an area lacking in data and recommended best practices.

Felix Meier presented on a software tool he has written to help determine avalanche beacon reception distance. He stated, “SearchPath is a tool for visualizing the shape of magnetic field that emanates from a buried avalanche transceiver. Various parameters such as snow properties, dipole inclination, burial depth, number of receiving antennas and view plane can be chosen. The optimum search path can be determined.” More information can be found on Felix’s website: <https://felmeier.com/en/software/SearchPath.shtml> .

After six years of work with Version 1 of their platform, MountainSafety.info is implementing a major update of their online content management, collaboration, review, and translation tools. As well, the workgroup collaboration tools exist in almost 20 languages, allowing subject matter experts from all over the world to share their know-how and to contribute to translations without the barrier of having to manage a user interface in a foreign language.

Swiss Alpine Rescue gave a presentation on an avalanche accident that happened near the location where the practical day was held. Four local, young adult skiers were caught and carried in the slide. Two were able to self-rescue and help dig out one of their partially buried companions. They were unable to locate their missing friend.

None of the skiers were wearing beacons, and the avalanche danger rating was Considerable, moving to High. The roads were closed, but the initial rescuers were able to arrive by train. A helicopter arrived in one hour. Due to the hazards of the day and communication issues, the response was kept as small as possible. The missing skier was ultimately located under several meters of snow three hours later by a rescue dog. He was transported to the hospital by helicopter, where he later died.

Finally, U.S.-based speaker Laura McGladrey of Responder Alliance and the University of Colorado presented multiple times to different commissions, including a plenary presentation on the stress continuum and stress injuries amongst rescuers. This seems to be further along in the U.S. than it is in Europe, but ICAR attendees certainly took note. It will be interesting to follow how these principles are applied internationally over the next several years.

There were two new airbags displayed by vendors at the conference. The first was an electrical airbag jointly developed by Ortovox and Arcteryx³. By using a super capacitor vs. a traditional battery, the companies were able to create inflation performance comparable to traditional compressed gas airbags, all while keeping the size of the airbag itself very compact. Aerosize, a Polish company, also showed off an airbag vest that looks very similar to an inflatable life vest. Their goal was to make a unit that could be worn with or without a backpack. This could prove

³ Arcteryx is a long-time MRA sponsor and supporter. The Arcteryx representative indicated the new airbags should be available in the U.S. for winter 2022/2023.

useful to mechanized users, such as helicopter crews or road maintenance employees, who traditionally don't wear a pack but still could benefit from an airbag.

Also of note was MEDCOM's work on management of avalanche victims. The following is from Dr. Alison Sheets' and Dr. Christopher Van Tilburg's report from MEDCOM. I think it is relevant and important enough to repeat here:

This year much of the MEDCOM work at the conference was in "development sessions" to bring recommendations and work in progress before the committee for discussion and critique. A great deal of time was spent on Medical Management of Avalanche Victims and an update on the avalanche resuscitation algorithm. Much of the discussion was related to hypothermia care and differentiating the asphyxiated avalanche patient from the hypothermic one. The survival of critically buried avalanche victims in cardiac arrest is, and has always been, grim. Once the recommendations are published, they will be available to the MRA as ICAR members. The basic decision point remains at 60 minutes. Any avalanche victim with signs of life is treated according to well established trauma and emergency care protocols. The **cardiac arrest** victim is assessed as follows:

- Critical burial less than 60 minutes, initiate resuscitation with emphasis on rescue breaths unless OBVIOUS signs of death from trauma.
- Burial greater than 60 minutes and open airway, assume hypothermia and resuscitate per hypothermia protocols.
- If burial greater than 60 minutes and airway is obstructed (nose and mouth packed with snow or debris), assume asphyxia, and do not resuscitate.

There are many details about measuring temperature in the field, use of monitors and ultrasound, witnessed vs unwitnessed arrest. The reality is that avalanche victims with unwitnessed cardiac arrest have an extremely low chance of survival. The working group admittedly states they are looking for the unicorns, those hypothermic patients that look dead but can survive with good neurological outcome. Wisely, there is a strong recommendation for medical directors to establish protocols for the SAR teams that address their specific environment, resources, EMS, and hospital systems as there is significant variability worldwide.