

Report on the meeting of the  
**AVALANCHE COMMISSION OF CISA-IKAR**  
(International Commission for Alpine Rescue)  
Coylumbridge, Scotland 1-5 October 2003

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### **Business of the Avalanche Commission**

The Avalanche Commission's meeting was attended by about 30 members from about 11 countries representing avalanche forecasters, rescuers, educators, and equipment manufacturers. During the Congress only about one-day's time was dedicated to the Commission's business. This included short discussions about future directions, a proposal for a January 2004 meeting, and the election of a new Commission president. Our new Commission president – unanimously elected – is Mr. Hans-Jürg Etter (a long-time director of the Davos Ski Patrol and currently an avalanche forecaster with the Swiss Federal Institute for Snow and Avalanches). Unlike past years, no position statements were made regarding avalanche-related equipment, though several new products and concepts were discussed. The Commission wants to continue to meet and work with equipment manufacturers so to encourage technology and product innovations for avalanche rescue.

For most of the Congress the Avalanche Commission joined the Terrestrial Commission for joint sessions. (The Medical and Air Rescue Commissions met off site.) The meeting's agenda included discussion of avalanche rescues and accidents involving rescuers with a goal to seek lessons-learned. This is an entirely new and very refreshing attitude amongst participants to share lessons-learned from close calls and mistakes. This new sense of openness and collaboration is an expressed desire of CISA-IKAR President Mr. Toni Grab.

I was active in the joint meeting by presenting a lesson's-learned presentation regarding mistakes made in USA avalanche rescues. Mr. Dan Hourihan also presented an excellent presentation on the Incident Command System and how it was implement for a large-scale avalanche SAR operation in Alaska. Within the Avalanche Commission I also presented a report of USA avalanche accidents from the 2002-03 season. After the meeting I have stayed in touch with the new Avalanche Commission president and assisted in collecting avalanche accident statistics. The following is a summary of key discussion points of avalanche-related matters from the meeting.

### **Accident Statistics**

In past years the collection of the statistics on avalanche fatalities and the discussion of significant accidents were the major topics of the meeting; however, this year the collection of statistics was tabled. It was not until after the first of 2004 that statistics were finally compiled by the combined efforts of Misters Roland Meister, Hans-Jürg Etter, and Dale Atkins. In 2002-03 185 fatalities occurred in the IKAR-member countries (Table 1).

This number was well above the 20-year average of 155 deaths. The majority of deaths in Europe occurred to backcountry skiers/snowboarders and off-piste skiers/snowboarders.

Many of these victims can be classified into the new and growing marketing category called “free rider.” This marketing categorization – typically ages 15-30 – is as much about attitude and appearance than skill, knowledge, or experience. These young people – both male and female – frequent ski-area terrain parks and/or seek the steep and deep by attacking bold lines by skiing fast with few turns and/or by leaping (aka “hucking”) off rocks and cliffs. Free Riders and their need for avalanche education is a serious topic in Europe. In the USA this new and exciting bred of skiers/snowboarders are just starting to appear.

country	back-country	off area	ski area	climbers	residents	highways	snow-mobiles	misc.	total
Switzerland	8	12	0	1	0	0	0	0	21
France	15	9	0	2	0	0	0	0	26
Austria	21	6	1	5	0	1	0	0	34
Italy	19	3	0	1	0	0	0	1	24
Germany	2	1	0	0	0	0	0	0	3
Great Britain	0	0	0	1	0	0	0	0	1
Norway	2	0	0	0	0	0	0	0	2
Poland	0	0	0	1	0	0	0	7	8
Slovenia	1	0	0	0	0	0	0	1	2
Spain	0	1	0	0	0	0	0	0	1
Slovakia	2	0	0	2	0	0	0	0	4
Canada	18	1	0	1	0	0	9	0	29
United States	8	3	0	5	0	0	14	0	30
<b>TOTAL</b>	<b>96</b>	<b>36</b>	<b>1</b>	<b>19</b>	<b>0</b>	<b>1</b>	<b>23</b>	<b>9</b>	<b>185</b>
%%	51.9 %	19.5%	0.5%	10.3%	0.0%	0.5%	12.4%	4.9%	100.0%

Table 1. Avalanche Fatalities in IKAR-member Countries, 2002-03. (No avalanche fatalities were reported in Croatia and Liechtenstein. No report from Andorra, Bulgaria, Czech Republic Ireland, Romania, Sweden.)

In 2003-03 there were no unusual or exceptional avalanche events affecting European towns or transportation corridors.

### Avalanche Dogs

Little discussion was undertaken on behalf of dog handlers but these rescuers are planning to meeting again this winter at Diavolezza (Switzerland). There they will share experiences, techniques, and concerns. It is important to note that through the efforts of MRA member and US-IKAR alternate Chris Utzinger that two Swiss handlers (and IKAR members) Axel Budde and Marcel Meier and their dogs have visited the States to conduct and participate in avalanche-rescue dog trainings. US MRA avalanche rescue dog handlers (Dan and Patti Burnett – Summit County Rescue Team) have also visited Axel and Marcel in Switzerland. The contacts and exchanges that Chris Utzinger has facilitated are a tremendous benefit for the MRA.

## PRODUCTS / CONCEPTS

### Training Centers and Systems

Several transceiver manufacturers and consultants in cooperation with ski resorts have created Avalanche Rescue Training Centers. The centers are aimed toward “free riders” but can be used by any one. The best systems appear to be that of Barryvox [[www.girsberger-elektronik.ch/barryvox/atc.htm](http://www.girsberger-elektronik.ch/barryvox/atc.htm)]. Last winter at least one site was installed at Diavolezza (Switzerland). It is a permanent mounted control unit linked by radio to a maximum of 16 remote controlled avalanche beacons. These beacons can be buried for the entire winter season. An optional unit can be employed to signal the find when a probe hits a target covering the beacon. Word has it that this site was well used. Beware, the cost is not cheap but the rewards can be very great.

If portability is important the components can be utilized separately and carried to schools and other programs (figures 1 & 2) as a “system.”



Figure 1. Barryvox Avalanche Training System, control box for up to 16 beacons.



Figure 2. Barryvox RTX457, remote control avalanche transmitters and control box.

Swiss avalanche transceiver expert Manuel Genswein [[manuel@genswein.com](mailto:manuel@genswein.com)] has a less-expensive but just as sophisticated version of a training center and system.

In the USA, Backcountry Access will be developing simple training centers to be installed at a number of western ski areas during the winter of 2004-05. These centers will have hard-wired transmitters that are much cheaper than the remote controlled units. Also in 2004-05 Orotvox plans to offer a remote control training system.

## Training Product

Girsberger Elektronik AG has developed a nifty training tool called the TT 457 (figure 4). It is simple to use (though a sophisticated transmitter) and ideal for training situations both indoors and outdoors (but in the cold you will want to add a heat pack to keep the battery warm). It can mimic different brands' signal patterns and its transmit power can be changed from full strength to a minimum of about 5 meters. It is a great teaching tool, and affordable, too. Contact Chris Utzinger for additional information [chris@mountainlife.us]



Figure 3. Training Transmitter 457.

## Cell (Mobile) Telephone: Benefon GSM+GPS

Franz Marx of Austria reported on a new mobile phone and technology from Benefon Oyj [www.benefon.com/usa]. This dual-band mobile phone also serves as a full-function GPS and PDA, but more importantly are its other capabilities. It has the capability to receive real-time "travel" alerts (e.g. weather and avalanche warnings) and to locate the user within in an accuracy of 10 meters – worldwide. It also has an "emergency button" that sends out text and geographic coordinates, and it can receive coordinates from any GSM phone. The phone appears to be a tremendous asset for accident victims as their exact location can be transmitted as a companion signal along with their call for help.

When the emergency button is pressed an automatic signal is sent to iJET Travel Risk Management [www.ijet.com] with the phone's exact location and also establishing a speakerphone voice connection. IJET is a 24/7 worldwide service that tracks, monitors, and communicates with travelers.

## Transceiver Operated Access Gate

I am not very clear on where this device has been installed or by whom, but it is very similar to something that has been in place for many years at the Sunshine Village Ski Resort in Alberta, Canada. After an accident in the lower Wallis region of Switzerland where an off-piste family was caught – one child buried and killed – an avalanche safety

gate has been installed along the ski area boundary. The gate will only open when it detects a transceiver signal and then closes automatically. The gate only operates when the avalanche danger is low to moderate and remains locked when the danger is considerable or greater. I believe the Bridger Bowl Ski Area (Montana) may also have something similar. Of course with any of these gates it is possible to go around the gate and also there is the issue of liability if the gate is open and an avalanche accident occurs.

### **Avalanche Transceiver: Wearable Sensors**

Though not formally presented at the IKAR meeting I did meet with Mr. Florian Michahelles of the Perceptual Computing and Computer Vision Group of the Swiss Federal Institute of Technology Zurich. Michahelles and Bernt Schiele [[www.vision.ethz.ch/projects/avalanche/](http://www.vision.ethz.ch/projects/avalanche/)] are developing a new approach to enhance companion rescue by utilizing wearable sensing technologies.

Basically their working prototype uses a handheld PDA (figure 4) to visually show the victim's location along with a triage scheme presenting heart rate, blood oxygen saturation, potential air pocket, and victim's orientation. Such a device – especially the visual display of information – could be a significant improvement for companion rescue.



Figure 4. Prototype display for wearable sensor technology.

## LESSON'S LEARNED

### Avalanche Rescue

Representatives from Austria, France, Italy, Poland, Switzerland, and the USA presented case histories of avalanche rescues. Some of these rescues were textbook examples of well-organized and well-managed operations. In some other cases the rescue went horribly awry when a second avalanche caught and even killed a rescuer.

Below are some common themes identified by this writer from the different presentations.

#### *Rescues where things went well:*

- Having and following a rescue plan
- Implementing a practiced rescue plan
- Developing clear objectives/mission statements
- Interviewing, re-interviewing, and recording statements from RPs
- Having a redundancy of potential command\*

\* A redundancy of potential command means having individuals who are well versed in all facets of avalanche rescue and capable of carrying out any leadership role. Additional command-type leaders improve anticipation of problems, needs, and wants especially in terms of planning and logistics.

#### *Rescues where things went poorly:*

- Not having or not following a rescue plan
- Not changing plan to adapt to changing conditions
- Not understanding the situation – not knowing what they were getting into
- Not realizing the potential or increasing danger: both command and individual rescuers
- Not having avalanche-experienced leaders
- Rescuers working alone

The bottom line in avalanche rescue – like all SAR operations – is that success is the result of:

- Pre-planning
- Investigation
- Problem identification
- Proper application of resources
- Strong management

The above lessons learned came from all the different presentations, but five presentations stood out. One was Mr. Dan Hourihan's presentation of ICS and how it was applied to a large avalanche SAR operation in Alaska at Turnigan Pass in 1999. ICS is a new concept to most European SAR teams.

Mr. Hans-Jürg Etter (Switzerland) presented a case report of a well-run operation where four "Free Riders" skiing off-area near Davos triggered a huge avalanche, over 1 km across. The search area was more than 120 hectares in size. All four victims were recovered alive, and the total search time was only 3.75 hours. The operation was terminated because no new information was learned indicating there might be others caught, and the entire debris area had been searched with transceivers, Recco, and dogs. For the record, 23 rescuers and 8 dogs were used and the total cost was 27,000€. One

mistake rescuers made was forgetting to call back area hospitals when the operation was over.

Mr. Rieman Leslaw of Poland presented a notable talk regarding an avalanche that caught and buried 9 teenage hikers in January 2003. Six of the victims were swept into a lake and drowned. This was a large and complex SAR operation involving dive rescue and Slovakian rescuers, as well as the usual avalanche- rescue-type issues. A key lesson learned is to plan for the worst because it may happen. The last three victims were recovered in mid June, nearly six months after the accidents.

Another notable accident involved a close call in Austria on New Year's Eve, 2002 when rescuers traveling high above triggered a second avalanche that caught 53 fellow – and lucky – rescuers and eight rescue dogs! Fortunately none of the rescuers were completely buried though two of the rescue dogs were buried 2 meters. Both survived. Lady Luck was with these rescuers and none were buried and it only took 10 minutes to locate all the rescuers. An accurate list of names was available at the site and was used to confirm everyone. How did it happen? All too easily.

A small field team was retracing the route of some climbers whom had been caught in an avalanche the day before. One man was still missing. The search team could not see their fellow rescuers staging below when they inadvertently triggered the avalanche. Bad weather had hindered the search effort and kept the helicopters grounded. Normally observers in a helicopter quickly check the upper parts of routes and assess the overall conditions. This time it seems it was forgotten how long it takes to check out a situation by foot, so rescuers were inadvertently allowed to stage before leaders knew the whole situation.

Lakes and avalanches do mix and Nick Forwood of Mountain Rescue Scotland presented a case history of an avalanche accident where two climbers were swept into a lake and drowned (1994).

In the last 10 years avalanches have dumped people into water in Canada, New Zealand, Norway, Poland, Scotland, and the USA. Rescue teams that serve areas where avalanche-affected trails and roads meet water would be wise to include their local dive rescue team into pre-planning and maybe an occasional practice.

## TECHNIQUES

### Probing

Philippe Henry of Chamonix, France (ENSA) reports a new standard has been developed for the probing of buried avalanche victims. This new method is taught by all “National [skiing and mountaineering?] Centers” and will make it easier for rescuers to conduct probe line searches. Below are the three methods taught in France.

*Rapid Search – OLD* (Similar to the NSP “close-order coarse probe.”)

- 1 hole-per-step
- 50 x 50 cm probe-grid spacing
- probers stand should to shoulder
- 2m maximum probe depth

- 15-20 probers maximum per probe line
- probe line boundaries flagged every 3m.
- commands:
  - “Probe” – wait for probe to be inserted and withdrawn and then rested against shoulder
  - “Step” – advance 50cm
  - “Probe”

*Thorough Search* (Equivalent to the North American “Fine Probe”)

- 3 hole-per-step
- 25 x 30 cm probe-grid spacing
- probers stand hands on hips, elbow to elbow
- 2m maximum probe depth
- 15-20 probers maximum per probe line
- probe line boundaries flagged every 1.5m.
- commands:
  - “Probe Middle” – wait for probe to be inserted and withdrawn
  - “Probe Left” – wait for probe to be inserted and withdrawn
  - “Probe Right” – wait for probe to be inserted and withdrawn and rested on shoulder
  - “Step” – advance 30cm

*Rapid Search – NEW* (Similar to NSP “open-order coarse probe.”)

- 2 holes-per-step
- 50 x 50 cm probe-grid spacing
- probers stand one arm out to shoulder
- 2m maximum probe depth
- probe line leader in line
- probe line boundaries flagged every 3m.
- commands:
  - “Probe Left” – wait for probe to be inserted and withdrawn
  - “Probe Right” – wait for probe to be inserted and withdrawn and rested on shoulder
  - “Step” – advance 50cm

This new approach is effective; it requires fewer people to search larger areas and fewer people are needed on the probe line. Smaller probe lines are more easily managed and thus faster. Also it is important to note that the French use a 50 x 50 cm grid. This is significantly smaller than the US grid of 75 x 70 cm. A number of other European countries have adopted a tighter grid – typically 60 x 60 cm – as they have found the more open grid resulted in too many misses. The tighter grid pattern means a much higher probability of detection (POD). At the next CISA-IKAR meeting I will show the results of a study comparing PODs of different probe spacings.



## **Avalanche Rescue Response – Switzerland**

Though not an example of any specific technique Mr. Domonik Hunziker (SAC) described the general response to Swiss avalanche accidents. The operations consist of three principal components: search, recovery, and post care. Swiss rescue teams respond to more than 50 avalanche accidents a year and typically “save 3-4 times more than die.” Most accidents occur at a danger level of 3 (Considerable in North America) and the alarm is often reported by cell phone. It is common to have 3-4 reports of the same accident called in by witnesses.

Cell phones have significantly reduced the alert time, and helicopters have reduced travel time, so on average it takes an amazingly short 22 minutes from the time of the accident until rescuers arrive on scene. Well-trained and practiced rescuers improve efficiency so that on the typical operation only 10 rescuers are needed. A major difference between avalanche-rescue response in Switzerland and the USA – besides the helicopters – is the addition of a doctor, paramedic, and an avalanche dog plus handler immediately being flown to the accident. Two other notable differences are searching with transceivers from the helicopter and the use of Recco in all avalanche rescues (see attached Recco newsletter for additional information).

## **EQUIPMENT STANDARDS**

### **Avalanche Transceivers – ETSI EN 300 718**

A motion by Avalanche Commission member Mr. Manual Genswein (Switzerland), et al., was put forth to the General Assembly for IKAR to support a change to the European avalanche transceiver standard (EN 300 718). The proposal – with strong support by many avalanche rescue experts – seeks to “prohibit features that do not enhance the search functions” of transceivers. This proposal is the direct result of a new Pieps transceiver that includes altimeter, inclinometer, and a compass. The fear by many in the avalanche community is that such features change the primary purpose of an avalanche transceiver, and these features will cause people to remove the transceiver from around their neck where it might be separated from the user in an avalanche. Unfortunately Manual did a terrible job of explaining the reason for this proposal. Many people in all Commissions thought that he was trying to prohibit all changes and limit innovation. The ensuing debate was very heated.

I feel very strongly that features that do not enhance the search functions and/or user’s medical status should be prohibited. I fully support Genswein’s concern and position as long as it includes a provision okaying medical scanning technologies (see earlier section Avalanche Transceivers: Wearable Sensors). The new Pieps unit with an internal compass – not yet available in the USA – is seriously flawed, and in my opinion is no longer a rescue device. For the compass to work the transceiver is automatically turned off (the transceiver emits an electro-magnetic field). At that point it is no longer a functioning avalanche transceiver. Hypothetically speaking a user of this unit in white out conditions – using it both for avalanche rescue and navigation – is seriously at risk.

Genweins’ motion was tabled until next year, so CISA-IKAR leaders can contact manufacturers to discuss the issue in more detail.

## **FUTURE MEETINGS AND TOPICS**

The Avalanche Commission will hold a winter meeting hosted by the Swiss Alpine Club in Diavolezza (near St. Moritz) on January 15-18. It will be a field-oriented session to share training and rescue tips and techniques.

The interest and sharing of lessons-learned is strong amongst the current CISA-IKAR membership. For next year an important theme will be rescuer safety, in terms of operations and general rescuer-safety training. Also there is interest in discussing long duration operations, too.

Also next year at least two topics will be proposed for standardization: avalanche flags and avalanche rescue terminology, especially for companion transceiver rescue. This writer will also have pertinent information for the Avalanche Commission regarding the POD of probe-grid spacings and the use of ground penetrating radar (GPR) for finding buried objects.

Next Fall's meeting will be in Zakapone, Poland.

## **THE FUTURE**

The reasons and objectives for continued involvement by the USA in CISA-IKAR have not changed. Avalanche accidents and deaths in the USA are increasing and IKAR is a very important forum for USA SAR personnel and avalanche workers. IKAR continues to be the best forum for the exchange of information and ideas especially in terms of avalanche rescue. The MRA is the best vehicle to disseminate this information to across the USA.

It is very important MRA teams and ski patrols stay current on the latest developments in avalanche rescue, education, accidents, litigation, forecasting, etc. For years, avalanches have been generally thought of as a European problem. This is no longer true. Avalanche deaths in the USA are similar to those suffered in Austria, France, or Switzerland.

Membership in IKAR gives the MRA the opportunity to share information and learn from other experts. IKAR is becoming a repository and also a clearinghouse for mountain-safety education materials. In terms of avalanche awareness materials (brochures, posters and booklets) targeted for the general public the European and Scandinavian countries are much more productive than the USA.

There are several issues that warrant continued USA involvement in the Avalanche Committee of IKAR, some specific objectives are also mentioned:

- Avalanche education: since most victims cause their own avalanche, most accidents are preventable. Better education and training can help to reduce the number of accidents.
  - specific objective: Need to learn more about avalanche training programs in other countries.

- Rescue equipment and techniques: IKAR is virtually the only venue for USA SAR personnel to learn of new techniques and of new equipment.
  - specific objective: Investigate the use of GPR for avalanche rescues.
- Accident data collection: The continued collection of accident data is most important. Research ultimately aids in the prevention of accidents and offers improvements in rescue methods. In the last 10 years IKAR has been the focal point for the initial presentation of updated survival probabilities and the field triage and treatment of buried avalanche victims. Much of this information is still unknown to USA SAR personnel.
  - specific objective: Continue the data collection and the presentation of case reports at annual meetings. More data and research is needed as to the cause of death, position of victim, victim's skill and knowledge levels, and decisionmaking.

### **ATTACHMENTS**

- USA avalanche report to the 2003 CISA-IKAR meeting (USA\_Avi\_rpt03\_eng.pdf)
- Lessons Learned: Mistakes in Avalanche Rescues, the US Experience (IKAR2003\_Atkins.pdf)
- Recco Newsletter, December 2003. (News2003\_Eng.pdf)
- List of ski resorts worldwide equipped with Recco. ((list\_all\_ski\_resorts031112.pdf)

Submitted by Dale Atkins, March 19, 2004