

Report on the meeting of the

## **AVALANCHE RESCUE COMMISSION OF IKAR-CISA**

(International Commission for Alpine Rescue)

**Malbun, Liechtenstein – October 19-24, 2002**



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### **IKAR Background**

IKAR-CISA was founded in the middle of the past century to exchange know-how on mountain rescue amongst rescue organizations of the countries along the Alps – Germany, Austria, Switzerland, France and Italy. The abbreviations IKAR-CISA are the German and French acronyms for “Internationale Kommission fuer Alpines Rettungswesen” and “Commission Internationale de Sauvetage Alpin”.

IKAR is lead by an 8-person board and consists of four sub-commissions with individual focus on Terrestrial Rescue, Avalanche Rescue, Air Rescue and Mountain Emergency Medicine.

Over the past decade IKAR has grown to include the United States and Canada, the Scandinavian countries as well as more recently the Eastern European countries. Such growth brings new challenges: Traditionally the conference language was German. Today it is English, with simultaneous translation to German, French and Italian to accommodate the 33 member organizations from 22 countries. With the diverse membership IKAR now has, there are countries with state-of-the-art mountain rescue organizations and other countries that are new to the business, due to lack of know-how, experience and/or funding. The challenge for IKAR is to provide knowledge transfer for all levels of expertise.

### **Personal Introduction**

A native of Switzerland I call western Montana home. I am an alpine patroller and avalanche dog handler with the Lost Trail Ski Patrol, a Wilderness Emergency Medical Technician and mountain rescue team leader with Ravalli County Search and Rescue, and an instructor with the

Aerie School for Backcountry Medicine. Through these activities I am affiliated with the Mountain Rescue Association, the National Association for Search and Rescue as well as the National Ski Patrol.

Since 2001 I have been involved in various translation tasks for IKAR. In 2002 I was invited by the Mountain Rescue Association to attend the annual IKAR conference as an alternate delegate to the Avalanche Rescue Commission in lieu of Dale Atkins from the Colorado Avalanche Information Center, who has retired from this position.

I would like to take this opportunity to thank Dale Atkins for representing the Mountain Rescue Association and the US avalanche community in the IKAR Avalanche Rescue Commission for several years! I learned first hand that he was well respected by his international peers as an avalanche scientist, fellow rescuer and mountaineer.

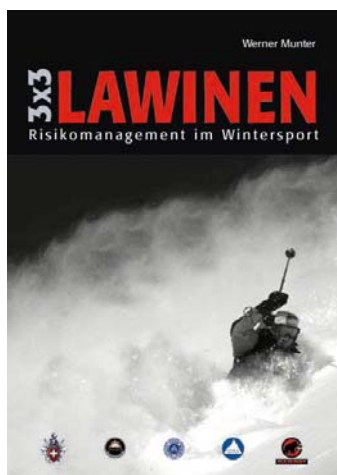
Following is my report of the sessions of IKAR's Commission for Avalanche Rescue:

### **1. Strategic methodologies for avalanche danger assessment**

The conference started for the Avalanche Rescue Commission with a joint session together with the Terrestrial Rescue Commission. The topic was a comparison of the different methodologies that have evolved in Europe over the past five years as part of a new strategic avalanche theory to assess the avalanche danger.

Werner Munter was the first to come up with his Reduction Method almost ten years ago. Other strategies have shown up in the Alps and are partially supported by the alpine clubs of the different countries. The three additional methods, which all more or less base on Munter's ideas are the Stop & Go (Austria), the Snow Card / Factor Check (Germany) and the NivoTest (France). The four different strategies are briefly explained hereafter.

#### **3x3 Filter and the Reduction Method, Werner Munter, Switzerland**



Three avalanche factors, the conditions (snow pack and weather), the terrain and the human factors are repetitively assessed or filtered at three different levels – at home while planning, in the area and on the individual slope, therefore the term 3x3. As a control instrument the Reduction Method defines a socially acceptable residual risk level of 1, risk being the danger potential divided by the product of the reduction factors. In this formula the danger potential is a numerical representation of the forecasted danger descriptor and the reduction factors are numerical representations of slope angle, slope aspect as well as group size and spacing. These reduction factor definitions and values come from statistical evaluation of avalanche incidents.

For novices Werner Munter has defined an Elementary Reduction Method with which the backcountry user simply renounces from traveling on certain slope angles depending on the avalanche forecast: moderate danger level: no travel on slopes steeper than 40°; considerable danger level: no travel on slopes steeper than 35°; high danger level: no travel on slopes steeper than 30°; extreme danger level: no backcountry travel at all.

Werner Munter stresses that his method cannot eliminate risk, but that by using his approach the number of past avalanche fatalities could have been cut in half. The purpose of his method is to allow practitioners to make decisions within minutes without having to dig snow pits and to avoid what he refers to as a “deadly threesome”. A “deadly threesome” would be traveling on a 40° slope with a northern aspect during considerable avalanche danger. The methodology in its existing form is only good for the Alps, but can be adapted to other areas. In Europe Werner Munter’s 3x3 Filter and Reduction Method has shaken up and sensitized mountain guide associations and alpine clubs alike. Today his book “3x3 Lawinen” is officially recognized and recommended by the UIAGM (International Union of Mountain Guide Associations) and the UIAA (International Union of Alpine Associations) and is the basis for the avalanche training programs in all alpine organizations across the Alps. In December 2002 the third revised edition went into print with a new Golden Rule which bases on the Reduction Method and delivers quick results without having to calculate.

Further information in German can be found under [www.slf.ch/info/tour0-de.html](http://www.slf.ch/info/tour0-de.html). Book information: 3x3 Lawinen – Risikomanagement im Wintersport, Werner Munter, ISBN 3-00-002060-8.

### Stop or Go, Michael Larcher and Robert Purtscheller, Austria

This method uses Werner Munter’s Reduction Method as its Check 1. So Check 1 will allow you to travel on certain slope angles, depending on the avalanche danger level. Check 2 then requires you to observe the five factors: new snow, wind drift, avalanches, water saturation and settlement noises, assess whether they are dangerous for you. If one of the factors is dangerous, that means stop, which leaves you with the options to abort the trip or select a different, safe route. The observations in the terrain do require some training and experience.

**Stop or Go®** Strategische Lawinenkunde für TourengeherInnen

**Entscheidungsstrategie**

**Check 1: Gefahrenstufe und Hangneigung**

Gefahrenstufe	Hangneigung
1 gering	25°
2 mittel	30°
3 erheblich	35°
4 groß	40°
5 sehr groß	> 40°

**Check 2: Gefahrenzeichen erkennen**

Wahrnehmen: Neuschnee? Triebsschnee? Lawinen? Durchfeuchtung? Setzungsgeräusche?

Beurteilen: Gefährlich für mich?

Handeln: YES: STOP (Ausweichen, Abbrechen) / NO: GO

**Standardmaßnahmen**

Planung	Aufstieg	Abfahrt
<ul style="list-style-type: none"> <li>Wetter: Sicht, Wind, Temperatur</li> <li>Lawinenlagebericht: Gefahrenstufe, Gefahrenstellen</li> <li>Karte, Höhenkarte, Topographie</li> <li>TeilnehmerInnen: Gruppengröße, Eigenkönnen</li> <li>Notfall-Ausrüstung: VS-Gerät, Schaufel, Sonde</li> </ul>	<ul style="list-style-type: none"> <li>VS-Check: 10 m Entlastungsabstände ab 30°</li> <li>Laufende Orientierung: Gelände ↔ Karte</li> <li>Zusammen bleiben: Tempo und Pausen der Gruppe angepasst</li> </ul>	<ul style="list-style-type: none"> <li>Achtung: Abfahrt ≠ Aufstieg = Neuland!</li> <li>Normalabstand 30 m</li> <li>Einzelfahren ab 35°</li> <li>Klare Anweisungen: Abfahrtsbereich, Abstände</li> </ul>

**Ziele** ↔ Check 1: Gefahrengestaltung: Check 1 ↔ Check 2 (Sicht!)

In addition to these two checks the method also recommends different standard procedures during planning as well as for the ascent and descent to help reduce the risk. Standard procedures for planning include getting a weather forecast, an avalanche forecast, studying the map or guide books, picking your partners, deciding on the group size and knowing everybody’s capabilities as well as carrying transceivers, probe poles and shovels. Standard procedures for the ascent include checking everyone’s transceiver and staying at least 10 m apart on slopes steeper than 30°. For the descent spaces of 30 m are generally recommended as well as skiing one at a time on slopes steeper than 35°. The method also recommends constantly staying aware of your location on the map and keeping the group together during the entire trip.



The Stop or Go Method has been widely adopted by the Austrian Alpine Club. Copies of a training video in German, recorded in the PAL System, can be ordered from OeAV, Wilhelm-Grailstrasse 15, A-6010 Innsbruck

## Snow Card / Factor Check, Martin Engler and Jan Mersch, Germany

This method also starts with the danger level according to the avalanche forecast. Then the user has to pick the steepest 10 x 10 meter area within the danger zone. The danger zone itself will vary with the danger level. With a low danger level it consists of the ski track itself. With a moderate danger level it will include 20 – 40 m to the left and right of the tracks. With a considerable level the danger zone will consist of the entire slope and potential runout zones, and with a high danger level it will include the slope and adjacent areas as well as larger runout zones. After measuring the slope angle the user must determine whether the slope aspect and shape are favorable or not. When in doubt it is to be assumed that they are not.

The back side of the Snow Card consists of a hologram showing favorable and unfavorable exposures. In both cases low slope angles are shown in function of the avalanche danger level. Green stands for low risk, yellow for caution, red for high risk.

The Snow Card method foresees three user levels: basic, advanced and expert. Based on the user level additional factors can be observed and used in combination with the Snow Card to assess the avalanche danger. A basic user knows the avalanche danger level descriptors, can measure slope angles in the terrain and on a map, can determine shape and aspect of a slope in the terrain and on the map, and can recognize danger signals, such as new snow, wind drift, settlement noises and recent avalanches. In addition an advanced user can distinguish between windward and lee slopes and knows the impact of the current temperature on the snow pack. On top of that, an expert user is familiar with the mechanisms of metamorphism, knows the current layers of the snow pack and also knows the weather changes that have occurred in the area during the past two weeks.



The level a user belongs to is not just a question of his/her knowledge/skill level, but also a question of whether the appropriate information is available. In dense fog, for example, nobody can assess wind drifted snow, if you can't see it. Depending on the user level the factor check used in combination with the Snow Card may give varying results for the same area. A basic

user might decide to renounce from traveling on a certain slope whereas an expert user may conclude that travel may be possible on that same slope, if certain precautions are taken.

The Snow Card has been widely adopted by the German Alpine Club and the German Ski Association. Further information in German can be found on the Internet at [www.av-snowcard.de](http://www.av-snowcard.de). Book information: Die weisse Gefahr, Martin Engler, ISBN 3-9807591-1-3.

## NivoTest, Roberto Bolognesi, Switzerland



NivoTest is a catalog of 25 questions regarding the weather, the snow pack, recent avalanche observations, the route and the participants. If the answer to a question is yes, then you add the points indicated on a rotary dial. The back side then informs you about the risk you are assuming. The higher the total score, the higher the risk. The NivoTest is based on the classical formula for risk, which defines risk as the probability of the avalanche event times its potential damage.

The NivoTest is being used by the French Alpine Club as well as in the French speaking part of Switzerland. More information is available in French on the Internet at [www.meteorisk.com](http://www.meteorisk.com).

## 2. Meeting of Avalanche Dog Handlers

Sixteen avalanche dog handlers from Austria, Croatia, France, Germany, Liechtenstein, Norway, Poland, Slovakia, Slovenia, Sweden, Switzerland and the United States met to discuss several dog related issues.

### Cadaver Search

The question was brought up what the different countries do as far as cadaver search training for avalanche dogs goes.

Switzerland currently has no experience and does not provide cadaver training for avalanche dogs. Currently there ethnic issues related with getting real scent material. The Swiss Alpine Club will probably work with the pseudo-scent SOKKS mentioned below in the future.

The German Bergwacht's avalanche dogs in the Allgäu have been working with SOKKS for over a year. SOKKS is pseudo-scent that is applied to cotton in plastic tubes under pressure. Any stage of decomposition can be simulated using these tubes. The tubes can be used for training over an extended period of time. Prof. Dr. Wolf A. Kafka ([wolf.kafka@web.de](mailto:wolf.kafka@web.de)) has performed a

scientific study on the use of SOKKS and can provide information on where SOKKS can be purchased. Further information on the use of SOKKS for dog training can also be obtained from the Bergwacht dog instructor Heini Malue ([malue@t-online.de](mailto:malue@t-online.de)).

In Slovakia the mountain rescue has been working together with law enforcement to train for cadaver search. 18 avalanche dog teams have gone through this training so far. The Slovaks work with natural cadaver scent. According to Reinhard Gruber from the OeBRD (Austria's mountain rescue) the Slovaks are the most experienced within IKAR.

Croatia, Slovenia and Poland are all novices in this area and are getting their training from Slovakia.

France is not training their avalanche dogs for cadaver search. Cadaver search is performed by law enforcement.

6 Austrian avalanche dog teams have participated in a two-week cadaver training in Slovakia in 1998. It took a while for the dogs to alert on natural cadaver scent. The cadaver scent is obtained from crime labs and treated as needed with water and heat to simulate different stages of decomposition. Marian Matusek is highly recommended by the Austrians as instructor. A video on cadaver search has been produced in the meantime which can be obtained from Gerhard Imlauer ([gimlauer@aon.at](mailto:gimlauer@aon.at)).

In Sweden law enforcement is responsible for cadaver search. Currently a training project is under way with 80 female dogs. Results are expected to be available in a few years.

In Norway mountain rescue gets their cadaver search training from law enforcement. Currently there are about 100 certified cadaver dog teams available.

In the United States cadaver search is mostly performed by law enforcement, but also by search and rescue units. Cadaver search, however, is a separate discipline from avalanche search, although some dogs are cross-trained. Both natural scent articles obtained from law enforcement and crime labs as well as commercially available pseudo-scents are used.

Axel Budde, the chairman of the avalanche dog handlers within IKAR concludes, stating: that cadaver search is an advanced discipline for avalanche dog teams; that dogs react differently to cadaver scent; that there is usually no decomposition in avalanche victims if they are searched for within reasonable time; and that there is a need for further exchange of cadaver training information amongst the IKAR countries.

### **Avalanche Dog Workshop 2003 in Norway**

Mats Hjelle and Albert Lunde from Norske Redningshunder (Norwegian Rescue Dogs) present the concept. The workshop will be held in Jotunheimen from April 24.-27., 2003 and the cost per person will be € 70. To get there you fly to Oslo. Buses will be provided for the 5-hour ride to the convention location. Besides discussing general topics the focus shall be on the safety of rescue dogs in steep terrain. Other Norwegian dog teams from the police and army will be participating as well.

In 2004 an avalanche dog workshop is planned to be held in Zakopane, Poland.



## **Canine Agenda for the 2003 IKAR Conference in Scotland**

- ❑ Review of the workshop in Norway
- ❑ Cadaver search
- ❑ Exchange of training materials
- ❑ IKAR standards for avalanche dog teams
- ❑ Assist member countries in establishing standards

### **Switzerland's experience with the new canine training guidelines**

The Swiss Alpine Club has reorganized its Alpine Rescue. Avalanche dog handlers are now considered rescue specialists, similar to the helicopter rescue specialists. Avalanche rescue and area search has been combined from the organizational point of view.

There are no more A, B and C dog teams; just operational avalanche dog teams and avalanche dog teams in training. Dog teams must pass an entry test including obedience and practical ski mountaineering skills as well as a written exam on navigation, First Aid and avalanche rescue prior to being admitted to avalanche dog training. The training consists of two one-week classes in consecutive winters. At the end of the second class the team gets the chance to certify. Dog teams must recertify every year and attend a week-long class every other year.

The mountain area search test consists of a 300 meter wide area with 400 meters elevation gain. The area has to be searched for any amount of victims within 3 hours.

### **Impact of helicopter transceiver searches on avalanche dog teams**

Dominik Hunziker from the Swiss Alpine Club presents the new technology that the Swiss Air Rescue Rega is using. An external antenna is suspended about 5 meter below the helicopter and connected to an analog avalanche transceiver. The acoustic signal is fed into the helicopter's intercom system. The system has a range of about 180 meters and pilots were able to locate buried transceivers during test flights to within ½ meter. A buried transceiver was found within a 400 x 600 meter area within 8 minutes.



This technology is not in competition to avalanche dog teams and also does not impact their work. The helicopter performs the transceiver search prior to unloading the dog teams. While the helicopter is flying over the avalanche debris the dog handler can get an overview of the site and check for hang fire. By the time the dogs start their work the helicopter doing the transceiver search is done. The helicopter usually flies 10 – 15 meters above the ground and moves fairly quickly. There is no noticeable snow compaction by the helicopter downwash.

Tests were conducted where avalanche dog teams had to search for articles in avalanche slide immediately after the helicopter had performed a transceiver search. The dogs were able to locate the victims and articles without any problem. However, avalanche dogs must be trained to get used to the noise of helicopters.

More information on this technology can be obtained from Chris Utzinger ([chris@mountainlife.us](mailto:chris@mountainlife.us)).

### 3. Miscellaneous Presentations

#### Avalanche Incident in Zinal, Augustin Rion, Switzerland

Augustin presented details on an avalanche accident that occurred near Zinal, Switzerland on February 3, 2001. A female ice climber was caught in an avalanche and found the following day by organized rescue. Six members of rescue party that was searching during the night got caught by a second slide. Three rescuers were partially buried and uninjured; three were completely buried, one of which survived uninjured; two other rescuers lost their lives.

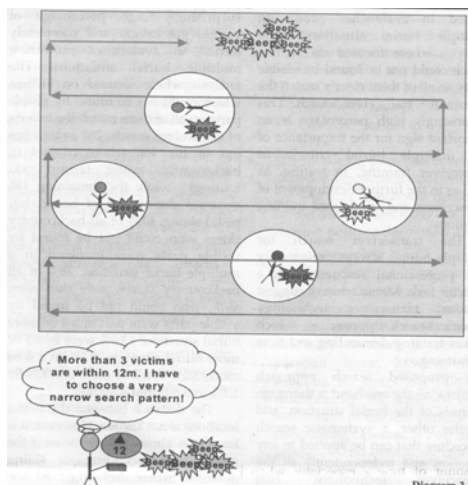
This incident led to the idea of an IKAR recommendation on avalanche rescue missions.

#### Multiple Burial Transceiver Search Strategy, Manuel Genswein, Switzerland

Based on the statistics of 466 avalanches triggered by skiers in Switzerland between 1970 and 1999 which completely buried 698 skiers, Manuel states that there were an astonishing number of multiple burial incidents. Therefore multiple burial scenarios must be taken into account in transceiver training, transceiver comparison tests and future transceiver development.

Multiple burial scenarios are very challenging for lay people as well as professional rescuers. The transceiver vendors recommend product-specific search strategies which are training-intensive and time-consuming. Manuel is suggesting a search strategy that is vendor-independent and can be applied in any scenario.

The main objective for the searcher is to get an overview and find out how many subjects are buried within a certain radius. The search is most challenging when several subjects are buried within close proximity.



The recommended method is to use a micro search strip width. This search strip width will vary depending on the number of burials and the radius. It is usually somewhere between 2 to 5 meters. While following the search pattern the transceiver is always held close to the surface in the same position. The distance indication and/or the acoustic signal are monitored closely while doing so. The pinpointing occurs using the classical orthogonal grid search method. The size of the area to be searched using the micro search strip width method is determined as follows: If the distance indicator keeps increasing or the acoustic signal keeps fading as you move along the pattern you have reached the edge of the search area. Direction indications given by digital transceivers are to be ignored completely. Multiple burials in close proximity

produce flux line patterns which make following a single flux line close to impossible. Stick with the pattern instead. Trying to take shortcuts usually ends in confusion and in an unnecessary waste of time.



#### 4. Vendor presentations

##### ARVA 9000, Bernard Gauderon, France

Bernard explained the new features of the ARVA 9000: a faster processor, a 65m range, constant signal strength regardless of battery life as well as enhanced support for multiple burials. NIC IMPEX also offers a training CD in different languages for the transceiver. ([www.nic-impex.com](http://www.nic-impex.com))



##### Barryvox Checkup System CS 3000, Martin Baumann, Switzerland



The Barryvox Checkup System CS 3000 lets professional users of the Mammut Barryvox transceiver perform functional tests on the electronic circuitry of their transceivers. Test results can be printed or stored on a personal computer. In case of a defect the stored data serves the technicians to troubleshoot the problem. The Checkup System also allows professional users to perform an automatic setup of the transceivers different features, such as enabling/disabling the analog search mode. This way the transceivers can be preconfigured according to the users' levels of expertise. ([www.girsberger-elektronik.ch](http://www.girsberger-elektronik.ch))

##### Mammut Barryvox, Albert Wenk, Switzerland

Albert mentions Mammut's R&D work to maybe integrate a clinometer into its digital Barryvox avalanche transceiver. The company has not yet decided whether this will become a standard feature. ([www.mammut.ch](http://www.mammut.ch))

##### RTX 457 Transceiver Trainer, Willy Zurkirch, Switzerland

The RTX 457 Transceiver Trainer consists of 4 457 KHz transmitters that can be set to emulate different transceiver brands as far as signal duration and signal separation go. The transmitters are housed in plastic tubes which are buried for practice purposes. The transmitters are remotely controlled to simulate different burial situations. The system allows for efficient avalanche transceiver training for rescue professionals and avalanche educators. ([www.girsberger-elektronik.ch](http://www.girsberger-elektronik.ch))



## **RECCO, Bernd Zehetleitner, Germany**



RECCO has improved their detector system with respect to frailty, weight and technology. The detector sends out a directional radar signal that is reflected by the circuitry in the RECCO reflectors. A weaker signal is also sent out to the back of the detector. The operator must therefore be careful not to wear any reflectors and to carry his avalanche transceiver and/or cell phone on his back and maybe turn them off. Otherwise these devices might reflect the RECCO signal. The operator must also be careful when operating the detector out of a helicopter as the detector may also pick up signals from the helicopter's circuitry. Many of the issues have been addressed with the new product version. ([www.recco.com](http://www.recco.com))

## **5. Recommendations**

### **Initiating and Suspending Avalanche Rescue Missions**

The Commission for Avalanche Rescue planned on releasing a recommendation regarding the initiation and suspension of avalanche rescue missions based on risk involved, chances of the victim's survival, etc. The group found that the topic was very complex and therefore developed a checklist during a brainstorming session. The members of the commission were asked to take the checklist home and verify or enhance it as necessary. The checklist will be available on the conference CD-ROM.

## **6. New Chairman for the Commission for Avalanche Rescue**

IKAR's President, Toni Grab, has been chairing the Commission for Avalanche Rescue ad interim. Othmar Pinoth had been asked to take over the position but declined due to his workload as President of the Italian Mountain Guides Association. No new chairman was elected during the Delegate Assembly. Instead the Board asked the member associations to nominate suitable candidates so that the position could be filled during the 2003 Delegate Assembly.

## **7. US Delegation**

The Mountain Rescue Association will replace the National Association for Search and Rescue in representing the United States in IKAR. The MRA will furthermore be responsible for the financial end of membership and appointing the representatives to the different commissions.

## **8. Conference Materials**

Presentations, checklists, avalanche incident statistics, agendas for future meetings that were collected, presented and developed at the IKAR conference were planned to be made available on a conference CD-ROM. To date we have not yet received the data.

## **9. Outlook**

The next IKAR conference will take place October 1-5, 2003 in Coylumbridge, Scotland. It will be hosted by the Scottish Mountain Rescue Commission. More details will be made available at [www.bluedome.co.uk/assoc/mrcscot/mrcscot.htm](http://www.bluedome.co.uk/assoc/mrcscot/mrcscot.htm).

Pending her consent, Jill Fredston from the Alaska Mountain Safety Center is nominated for the position of delegate to the IKAR Commission for Avalanche Rescue. I will continue to serve as alternate delegate.

Chris Utzinger  
Corvallis, MT, March 3, 2003