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The journal of Canada's avalanche community

SMART BOMBS

AVALANCHE AWARENESS IN NUNAVUT

Hot Routes,
Propagation Saw Test,
Knowledge Harvest and more!

Volume 83 Winter 2007
Cdn Publication #40830518

Cover shot: This shot was taken at Selkirk Lodge in March, 2007. Visible tracks are from the previous day on Solitude - just another day on the Justice glacier... Photo: Ken Bibby collection.

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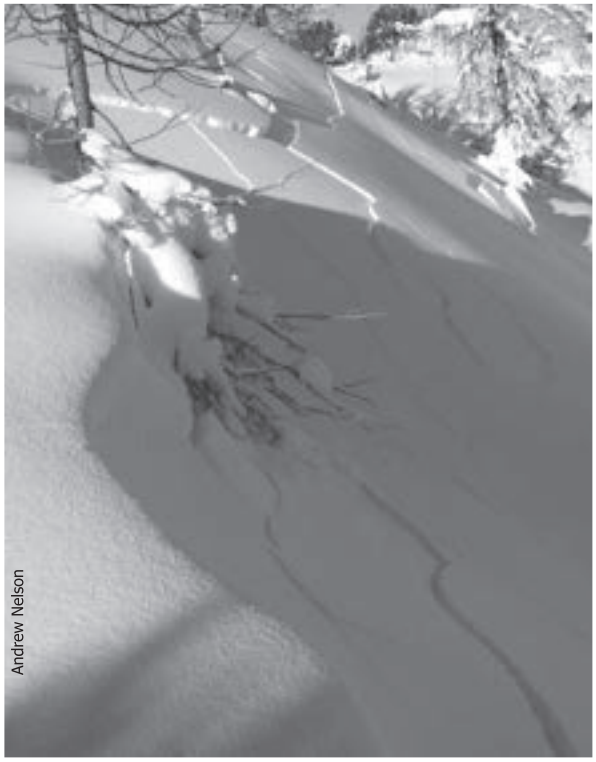
failure plane

In our last issue (Vol 82, Fall 2007) Professional Member Rob Hemming reviewed a snow study kit from Backcountry Access. The sidebar accompanying that review was a list of equipment recommended for snow profiles and test profiles. This was not written by Rob and he does not agree with some of the recommendations. The sidebar was the result of a collaboration between the editor and the OGRS 2007 committee. We regret the implication that Rob was the author, as he never approved the final copy of that element of the article



Andrew Nelson

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Our vision:
To be a world leader in avalanche awareness, education and safety services.

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This journal is the official publication of the Canadian Avalanche Association (CAA), the Canadian Avalanche Centre (CAC) and the Canadian Avalanche Foundation (CAF). The CAA and CAC are non-profit societies based in Revelstoke, BC, serving as Canada's national organizations promoting avalanche safety. The CAF is a registered charity formed to provide a tax-deductible fundraising mechanism for the support of public avalanche safety initiatives. The CAF is based in Canmore, AB.

The goal of *avalanche.ca* is to keep readers current on avalanche-related events and issues in Canada. We foster knowledge transfer and informed debate by publishing submissions from our readers. Responsibility for content in articles submitted by our readers lies with the individual or organization producing that material. Submitted articles do not necessarily reflect the views or policies of the CAA, CAC or CAF.

We always welcomes your opinions, teaching tips, photos, research papers, survival stories, new product announcements, product reviews, book reviews, historical tales, event listings, job openings, humourous anecdotes and, really, anything interesting about avalanches or those people involved with them. Help us share what you have. Please send submissions to:

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Good News and Bad

In late August of this year, we received the great news that Environment Canada was going to announce federal funding for the Canadian Avalanche Centre. Parks Canada and the Meteorological Service of Canada, both long-time partners in avalanche safety, were signing on to multi-year funding. For an organization like ours, knowing we have an operating budget for the next few years makes a huge difference. Thanks to both of these organizations for their commitment and confidence in our work.

That announcement came hard on the heels of some terrible news to all of us—the death of Fred Schleiss. We honour Fred's legacy in this issue with some memories from people who knew him well. He touched many in our industry and we don't have room for everyone's contribution, but if you have a Fred story to share, please let us know. We'd be happy to collect more for our next issue.

I worked for Fred in Rogers Pass back in the mid-1980s. He was everything I'd heard about—stern, demanding and fiercely protective of his program and his team. I became a professional member of the CAA in my first year there, even though I didn't meet the qualifications. Fred's take on it was "One year in Rogers Pass is worth five anywhere else—of course you qualify!" And so, on his word, I became a professional member.

I only had a few opportunities to ski with Fred, as those were the years where he was handing over the operational reins to his brother Walter. He was an excellent skier and all of us "new guys" on the team were eager to show we had the right stuff. I remember on one trip, we had paused on our descent through the thick Selkirk forest on the slopes of Mt. Fidelity. Fred ordered me to "ski to that tree there." I looked in the direction he pointed; trees were all I could see. Too intimidated to ask for clarification, I pushed off into the waist-deep and stopped where it felt right. As we re-grouped, he didn't say a word so I could only assume I passed. That was good enough for me.

As you may have noticed, *avalanche.ca* is now printed on different paper than it has been in the past. We wanted to improve the image quality of the photos that are so generously donated by our readers, so we spent some time this summer investigating how we could do that and still stay within our budget. We were very happy to find that Hemlock Printers of Burnaby, BC could solve both those problems for us. On top of that, Hemlock has been named the Most Environmentally Progressive Printer in Canada for 2006 and 2007. In coming issues we will be exploring ways to take advantage of Hemlock's expertise in this area and make this publication greener.

We're also planning some new regular features. We'd like to highlight some great trips in the mountains, complete with information on things to look for and situations to avoid. If you'd like to share some local knowledge, contact me at mclayton@avalanche.ca. It would be great to hear from you.

M. Clayton

The view from up here

Selkirk Lodge perches high in the Albert Icefields of the Selkirk Mountains. In this photo we're looking SSE and on the skyline, from left to right, are Kodak, two ridge tops of Campion, Grizzly, and The Phantom.

Rob Buchanan

Mary Clayton

Clair Israelson had a enjoyable visit with Gerald Kampel, Founder and owner of Ortovox.

Let's make a deal.

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We bet your fingers feel warmer already.

If we choose one of your images for our cover shot, we'll send you a pair of Marmot gloves, just like these. **Submit your photos today!**

We're looking for avalanches in motion, people playing or working in the mountains, and great winter scenery. In order to meet printing requirements file size should be 5MB or larger. Send your digital files to publish@avalanche.ca.

InfoEx®

Industry Standard for an Extraordinary Industry

"InfoEx® is the morning newspaper of the Canadian avalanche community."
Dr. Bruce Jamieson, Applied Snow Avalanche Research Group, University of Calgary.

The Industry Information Exchange (InfoEx®) is a cooperative service managed by the Canadian Avalanche Association (CAA), providing a daily exchange of technical snow, weather and avalanche information for subscribers. Subscribers are organizations and commercial businesses employing CAA Professional Members and actively managing avalanche hazards during the winter months (e.g. backcountry skiing companies, BC Highways, mountain parks). InfoEx® is a uniquely Canadian service giving avalanche professionals access to data that is accurate, relevant and real time. This knowledge improves each subscriber's awareness of the conditions across western Canada, greatly enhancing their ability to manage their local avalanche risks.

InfoEx® also serves as one of the key sources of data used by the Canadian Avalanche Centre's public avalanche forecasters to produce and verify their products. The value of the InfoEx® contribution to the CAC public avalanche bulletin is estimated at an excess of $2 million annually. The significance of this contribution by avalanche professionals and their employers to public avalanche safety in western Canada can not be overstated.

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For more information on the InfoEx® program or any of the other programs and services offered by the Canadian Avalanche Association please contact us at 1-250-837-2435 or visit us at www.avalanche.ca
* Subscriber list current as of 2006-07 operating season.

canadian avalanche association
25 years of service: 1982-2007

Are We There Yet?

Troy Grant

The Canadian Avalanche Association (CAA) is a not-for profit, non-government organization that exists to serve and empower the professional avalanche community in Canada, avalanche workers and the operators that employ them. The CAA's vision, shared with our sister organizations (the Canadian Avalanche Centre and the Canadian Avalanche Foundation) is: To be a world leader in avalanche awareness, education and safety services. With 2007 drawing to a close I've been reflecting upon the CAA's progress towards achieving our vision, and the obvious question that arises: Are we there yet?

CAA Highlights for 2007

The CAA AGM and 25th anniversary celebration was truly a highlight, with a record number of members in attendance. Our membership is simply the finest group of people I have ever had the privilege to be associated with, and during this time together the camaraderie, generous sharing of experiences and new knowledge, and dedication to working together to continuously improve our individual and collective avalanche programs exemplified everything the CAA stands for. To every member, I offer a heartfelt "Thank you" for your professionalism and contributions to avalanche safety in Canada. The work you do is important; the way you do your work is inspiring!

Observation Guidelines and Recording Standards for Weather, Snowpack and Avalanches (OGRS) is the national technical data standard for professional operations. Every five years this document is updated to reflect evolving scientific knowledge and operational best practices. Last May a 10-person OGRS working group led by Cam Campbell was struck to propose new content, revisions and deletions to this document.

The CAA's Technical Committee, chaired by Rob Whelan, reviewed the proposed changes, accepting some and rejecting others. The OGRS working group then compiled all approved content changes into OGRS 2007. The new OGRS has now been published by the CAA and is available for users. Sincere thanks to everyone who helped in this endeavour. Once again it has truly been a community effort. It's interesting to note that Canada's OGRS is being adopted, in whole or in part, in the USA, New Zealand, Japan, Iceland and Sweden, and is attracting attention in numerous other countries around the world.

CAA Industry Training Programs (ITP) had their most successful year ever, delivering 27 courses to more than 520 students. All courses now have annual upgrades to curriculum, instructional support materials, and student resource and reference materials. New custom courses were developed and presented to the Canadian armed forces. CAA instructor teams taught courses in French in Quebec, and ran programs once again in Japan and Iceland. The New Zealand Mountain Safety Council has licensed the CAA Level 2 program for use in their country.

In addition to this international outreach, ITP continues to attract students from other countries to Canada for their avalanche training. Last year international students accounted for more than 15% of ITP enrolment. Students praise the professionalism and personal engagement of the ITP course instructors. The ITP instructor team has grown to more than 55 avalanche professionals who take time away from their avalanche responsibilities to teach CAA courses, sharing their technical skills, experience and wisdom with students. I offer my gratitude to all of the ITP instructors for your invaluable contributions to avalanche education, and to everyone who has contributed over so many years to get us to this enviable position. I truly believe the CAA's ITP courses are the best in the world!

CAAML 4.2 is the label of the most recent iteration of the CAA Markup Language, a mechanism for transferring avalanche related information between different computer operating systems in a commonly readable format using internet browser protocols. CAAML development has been led by Pascal Haegeli and Roger Atkins, with assistance from a host of others. CAAML is the operational foundation for InfoEx, CAIS, SnowInfoPLUS, and data transfer through the CAA and CAC websites. CAAML is fully GML compliant (Geographic Markup Language, the international standard for GIS applications), positioning us to move toward geo-referencing all Canadian avalanche data. No other country has developed such a comprehensive system for avalanche data management, and highly respected European avalanche organizations have expressed interested in CAAML evolving into an international avalanche data standard.

InfoEx grew to 96 subscribing operations, and became a web-based, real-time exchange for professional snow, weather and avalanche information. This collaboration helps all operations track avalanche conditions across the western cordillera, alerting subscribers to trends and anomalous events observed elsewhere, so they can avoid being blindsided by similar situations. The Canadian Avalanche Information System (CAIS) database, containing current and historical InfoEx reports, is being acknowledged by researchers as the most valuable avalanche data set in the world, positioning us to glean important new knowledge and operational insight from our collective contributions. I suspect that soon we will see the InfoEx concept adopted by several other countries. We did it first!

SnowInfoPLUS is getting an enthusiastic response from subscribers. This CAA-developed software package is designed as a fully integrated, comprehensive data management system for avalanche operations. Snow, weather and avalanche data is automatically graphed in time profile formats. Terrain atlases linked to photographs with write-on functionality, morning and evening team meeting documentation, daily operational assignments, run lists, automatic downloads of weather forecast information, InfoEx submissions, wildlife observations, and numerous other features are incorporated.

At the time of this writing, 20 operations have signed on to this service and many more are lining up to "kick the tires." This software will soon be used on ITP courses, and over time I fully expect that SnowInfoPLUS will become the "industry norm" for avalanche data management.

Why will this happen? The answer is simple: custom software with complex, specialized functionalities needed in modern avalanche safety operations requires intensive knowledge of avalanche work and best practices for software design, and the CAA's development team has these qualities in spades. A special tip of the hat is due to Roger Atkins for his vision and leadership in this initiative, and to the rest of the development team for their contributions. Developing custom software is also expensive. With many subscribers sharing development costs SnowInfoPLUS becomes affordable; very few organizations can afford to undertake a project like this on their own. It's one more example of the CAA serving our community. Yep, you guessed it—other countries are interested and asking questions. It seems we're doing something right.

eTraining for Avalanche Search and Rescue is a two-year, $800,000 project paid for by the National Search and Rescue Secretariat (NSS) New SAR Initiatives Fund to develop online training for organized avalanche rescue. Utilizing 3D graphics of real mountain locations and randomly generated scenarios, students will be confronted with realistic avalanche rescue dilemmas and be forced to make decisions with the clock running. Strategy, tactics, rescuer safety issues, risk and reward, and all the other challenges of real-life rescue situations will be experienced in a virtual environment.

Under Ken Wylie's capable leadership the CAA is bringing subject matter expertise and experience to the project. Susan Creighton (Assistant Dean, Faculty of Education at the University of Calgary) is internationally recognized as a leader in experiential, online learning. She has assembled a blue-ribbon team to work with the CAA's people, with the goal of making this the most realistic, effective and cost efficient avalanche training program in the world. Given the expertise and passion of the people involved, I truly believe we will achieve that goal.

Based on the eTraining work to date, the NSS people have asked us to prepare a second project proposal to evaluate the training efficacy of this program. They see broad application for this type of training elsewhere in Canada's national search and rescue community, and want to be able to conclusively demonstrate effective training for complex decision making in rescue response, and financial advantages compared to traditional training methods.

Manuel Genswein and other European experts are contributing state of the art technical materials for the eTraining project. This course will be available in English and French language versions, and at the ICAR meetings this fall I was asked if we could also do a German language version! My answer was Yes, if the European community will pay for the work.

It's clear the CAA is making steady progress toward achieving our vision—**To be a world leader in avalanche awareness, education and safety services.** Why is this important? In all sectors, societal demands for more and better avalanche protection are increasing. The CAA's role is to serve and support you, the front-line professional decision makers, in order for you to deliver world-class avalanche safety programs. The work you do protects human lives, and supports Canada's economic success. Our tradition of working together to advance our collective and individual responsibilities for public safety serves our community well. No one knows what challenges Mother Nature will throw at us this winter, but one thing is sure: we are most successful when working together.

I wish you a safe and enjoyable season.

Steve Blake collection

Winter is Here!

I realize everyone is jumping into the avalanche season with both feet as winter rolls around in earnest. With this in mind I would like to concentrate on our most pressing issue—the link between CAA training, worker qualification and scope of practice.

Winter mountain tourism is a growth industry with annual expenditures in the $1 billion range annually in BC. This is coupled with a boom in mining, hydro-power and petroleum operations, much of which is occurring in avalanche-prone terrain. The economic impact of avalanche closures on road and rail deliveries is astonishing, and forestry activities continue to push higher and deeper into the mountains.

This of course puts added pressure on the avalanche community, not only to deliver timely, cost-effective safety programs, but to meet society's expectations for professionalism and highly reliable public safety services. As the avalanche decision makers, we see the importance of science but we also understand that science can not provide all the answers. We know full well that operational decisions are based on a highly complex, intuitive, subjective analysis and judgement. Avalanche expertise requires a combination of technical training and extensive experience.

The membership tasked the Board of Directors to present a tangible Scope of Practice guidelines. We are fully cognizant this is not a new initiative, but we also recognize that now the timing is right for us to make some significant advances. Important historical influences read something like this:

- In the early to mid 1990s the CAA Board and membership took positive steps towards professionalism for avalanche workers beyond Level 2 training. At this time we saw the development of the CAA Professional Registry and the CPD initiative. I think we all can agree that the CPD program has been successful but the professional registry failed. The post mortem of the registry revealed the self-assessment process was too vague to produce consistent results, in large part because there were no articulated "scope of practice" standards for members to measure themselves against.

- In 2002, the CAA was active in the development of the BC "Results-Based Forest Practice Code" initiative, advocating for CAA training and experience. Those discussions resulted in government removing all references to avalanche safety from the Forest Practice Code.
- This was followed by the year that "avalanche" became a household word in Canada, after a number of high-profile accidents. The amount of public scrutiny of avalanche programs was unparalleled in the winter of 2002-2003, with the public and news media pointedly questioning the qualifications of avalanche workers.
- In the fall of 2006, Worksafe BC (WSBC) proposed that a "qualified registered professional" must assess all avalanche prone workplaces. WSBC received independent feedback from industry associations and the CAA that proved to be somewhat incongruent.
- WSBC presented a more onerous regulatory proposal in March 2007.
- A coordinated community response was presented at public hearings, which resulted in a commitment from WSBC to consult with stakeholders to craft a revised regulation.

That brings us to now. After extensive consultation, including the "Senators Summit" and the Canmore Industry Partners meeting, a draft document has been created that outlines the qualifications we feel avalanche workers should possess. There it is, in black and white, a clear definition of the minimum training and experience members should have in order to be called an assistant avalanche technician, an avalanche technician, an avalanche forecaster, or an avalanche program planner.

I urge you to read this document and give us your feedback. Our goal is to ratify these qualifications at the AGM this spring. If you have suggestions to enhance this document better, we need to hear from you this winter. We have come along way on this issue, and we need to get it right.

Many members will be impacted in one way or another by this proposal and some will likely need time to round out their qualifications. This point will be central to our discussions with WSBC. The proposed qualifications and scope of practice guidelines will add value to membership, bringing increased recognition to our members' specialized training, on-the-job experience, and commitment to continuing professional development. The guidelines will also help clarify a career development track for workers.

This work will provide a credential for employment that will be an "industry norm" and sector-transferable. Evidence of "due diligence" will be enhanced for members in the event of a mishap or accident, and employers will benefit from having industry norms for use as hiring criteria and as proof of their high operating standards. Regulators will also meet their objective, which is to have criteria in place for evaluating compliance with industry best practices. All in all we feel this initiative will ultimately mean greater public safety in the avalanche sector, and an advancement of professionalism for members, our employers, regulators and in the eye of the media and the public.

We enter into meetings with Worksafe BC and other stakeholders in January and we need to know the CAA's proposals accurately reflect the collective will of the CAA's membership. I look forward to receiving your thoughts and suggestions.

All the best and have a safe winter.

president@avalanche.ca

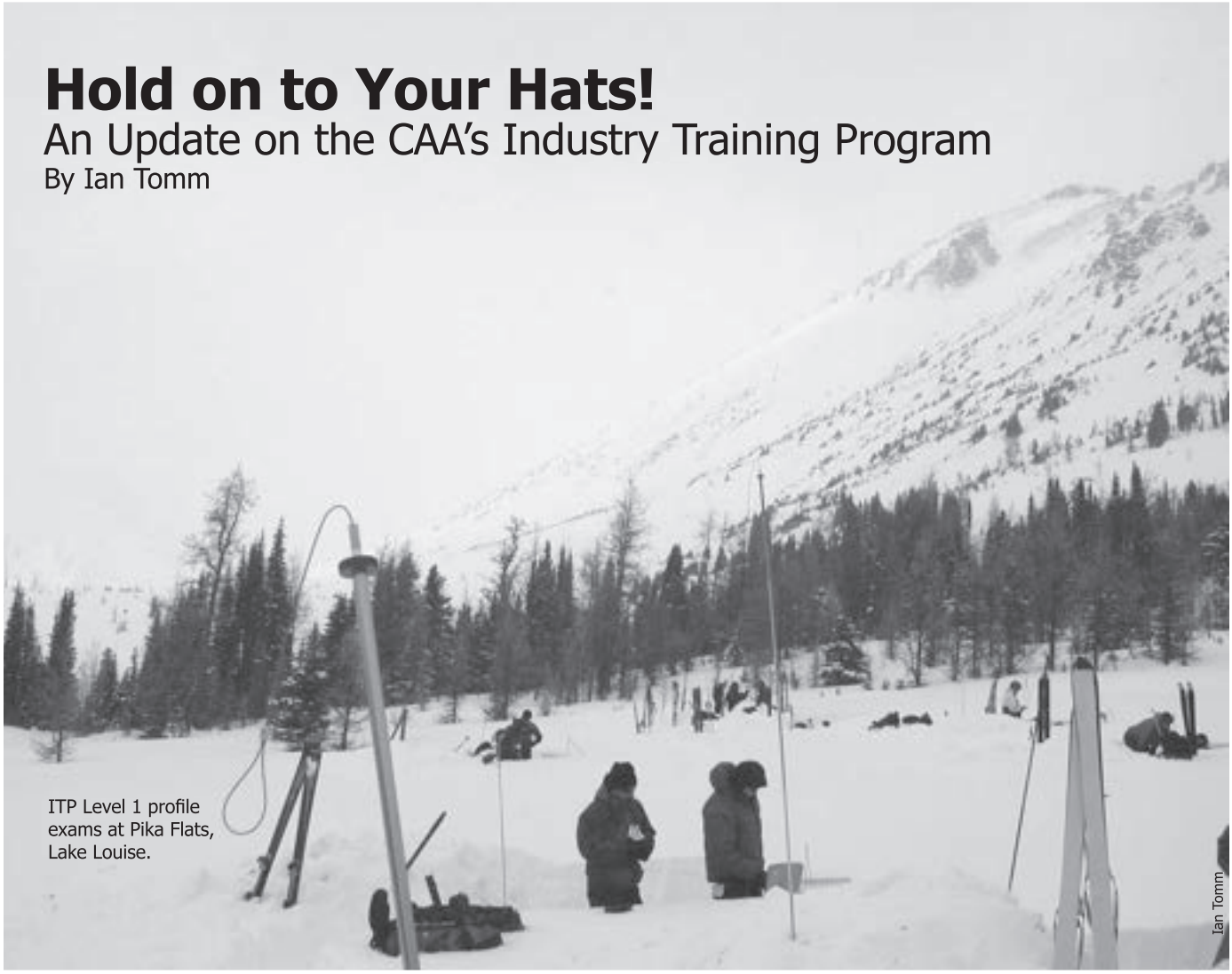
Read the DRAFT Stakeholders recommended qualifications for avalanche workers at:

CAA Website >> Members Only >> Information >> CAA Scope of Practice and Workplace Safety Issues

Hold on to Your Hats!

An Update on the CAA's Industry Training Program

By Ian Tomm



ITP Level 1 profile exams at Pika Flats, Lake Louise.

Ian Tomm

It's early December, the first field courses have just started to run and I'm sitting here, staring out the window of my office trying to understand the incredible demand for our training programs that is occurring this year. There are a lot of "firsts" thus far, as you will read below, but one thing is for certain—we offer the very best training for front-line avalanche workers internationally. The credit for that accomplishment goes to our membership and their commitment to excellence, and the dedication of our committees and instructor team.

It is true the demand for the Level 2 program has shrunk this year compared to last. Many, myself included, thought last year's spike in numbers wouldn't last, and so far, this year seems to prove that. However, we are already getting a fair number of inquiries for next year's Level 2 programs, so we may very well see a return to the enrolment numbers of the past.

Level 1, RTAM and all of our fall CPD seminars opened for enrollment on September 4, as in past years. Just three weeks out of the gate we were 75% booked and as of late November we were 100% booked with wait lists growing daily. This is a marked departure from previous years, and certainly the strongest early season enrollment I have ever seen in my six years managing the CAA's training programs.

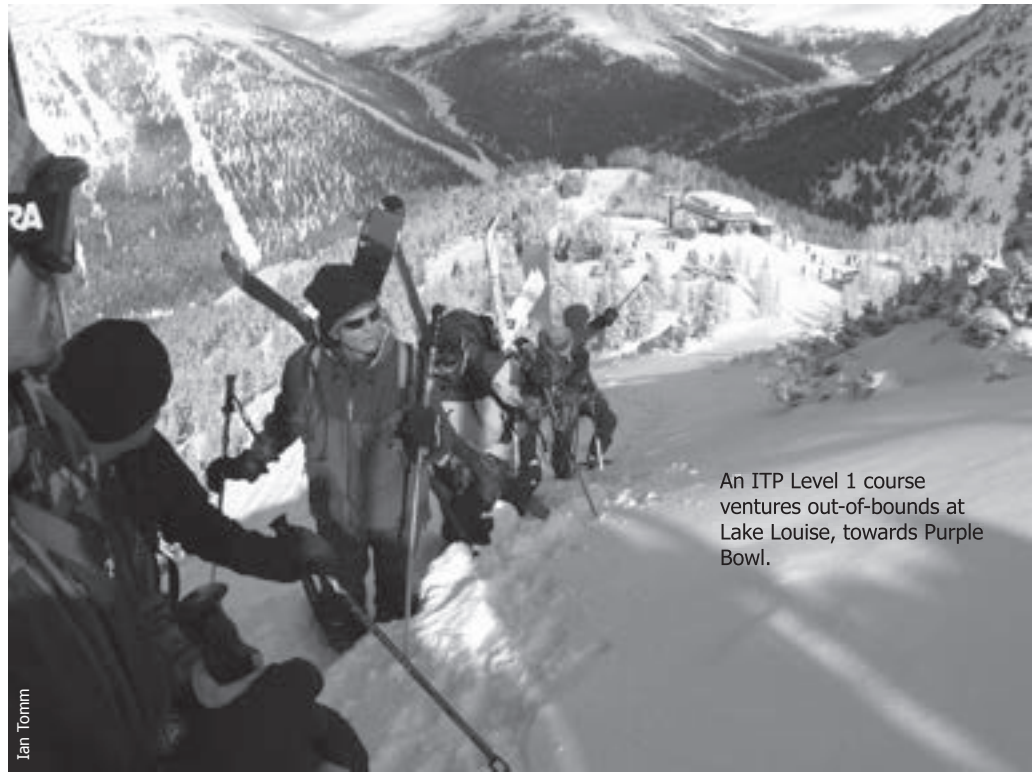
As in the past, hut-based courses were the first to fill. But what makes this year different is that, for the first time in the CAA's history, we have more hut-based than town-based Level 1s. Special thanks to Burnie Glacier Chalet, Ptarmigan Tours, White Cap Alpine and the Alpine Club of Canada's Kokanee Glacier Hut for their continued support of the CAA's training programs. Without their dedication to training tomorrow's workers, this volume of hut-based training would not be possible.

Another first for me this fall was the fact that we were 100% booked before the first field courses ran. Typically we have availability in our programs well into January. Not this year.

In the previous edition of *avalanche.ca*, you read about a new weather training initiative the CAA had initiated with Uwe Gramann and Ken Wylie. I am happy to report the feedback from both introductory courses and the advanced course includes some of the most positive comments the CAA has ever received on any of our programs, and

that's saying something. A pat on the back to Uwe and Ken for their dedication to developing the very best weather training programs available for front-line avalanche workers. These will now become annual courses in our program and, at your request, we're going to schedule an intro and an advanced course right around the time of the AGM in Penticton this spring.

Over the past few years we've been working to grow and develop our instructor pool, and we have some great new recruits on board. The strength of our program is directly related to the high level of professionalism and dedication found in our instructor team. As many of you are aware, being a CAA instructor is as much about volunteering your time as being paid for instructing on courses. Our team, now almost 60 strong, continues to dedicate a lot of time to program enhancement and all should be commended for their great work. If you have a colleague who is a CAA ITP instructor, thank them for their good work, exemplary representation of our association and its membership and their dedication to training tomorrow's workers.



Ian Tomm

An ITP Level 1 course ventures out-of-bounds at Lake Louise, towards Purple Bowl.

We've been able to breathe some new life into the Level 1 for Snowmobilers program. Randy Stevens and Amber Wood have taken the bull by the horns to make this work and now we have two separate snowmobile programs running this year—a seven-day Level 1 in the Valemount area, and a modular Level 1 that is comprised of the RTAM course and a sled-specific field course. While I wouldn't call enrollment strong in our sledding programs, the momentum and interest in our Level 1 standard by this sector of the avalanche community is encouraging.

Our partnership with the Department of National Defense continues to grow. While our Level 1-SAR course for the SAR Techs at CFB Comox was cancelled at the last minute, we do have another program running in January at White Cap Alpine. Our partnership with DND is in its infancy and we look forward to expanding it further to meet their avalanche training needs well into the future.

Once again, our friends in Japan and Iceland have contracted the CAA to run the Avalanche Operations programs in their countries. We always look forward to this opportunity to share and learn with other languages and customs.

We've expanded our administrative capacity at the CAA this year to better support our training programs. Audrey Defant (enrollment), Jan Sanseverino (support), Tammy Beech (shipping/receiving), Ken Wylie (curriculum), Mike Rubenstein (logistics and scheduling), and myself are all salaried staff dedicated to running and supporting our programs. In addition to this we have many contractors, typically ITP instructors, who work during crunch times and on special projects. This year our list of contractors includes Ken Bibby, Mark Bender, James Blench and Bill Mark (forgive me if I've forgotten someone). It's great to work with such a high-level team. We operate in a high-pressure, resource-limited environment every day and what a great job everyone does.

As in past years we will do our best to meet the demand on the Level 1 program with an overflow if the wait lists grow to that point. At this time we're starting to think an overflow Level 1 in Revelstoke might be possible in late February. If you have staff, friends or colleagues wishing to take the Level 1 this year but have been unable to enroll due to high volume in the program, please have them contact the CAA directly to be placed on the wait list.

Hold on to your hats, and have a safe and enjoyable winter!

>>Ian Tomm is the CAA Operations Manager

Ian Tomm collection

Enterprise Conflict Avoidance Policy

An Open Letter to CAA Members

From Steve Blake, CAA President

The board of directors and senior staff members have been receiving comments about the Enterprise Conflict Avoidance Policy. This feedback is vital to me and the other members of the board. There are many thoughtful and diverse opinions represented by the board and this range of perspectives helps us to get it right—usually. The board understands the risk of misreading the will of the membership. This is why all policy decisions are considered "interim" until the policy has been put into effect and tested by applying it to the daily operations of the association. The board is always prepared to reconsider policy positions.

Over the years the CAA and CAC have developed an extensive array of intellectual properties, products and services, I'll refer to them collectively as "products" from here on. As a not-for-profit organization, these products have been created to serve and support our members and the Canadian avalanche community. We feel the board would be remiss in our duties to the membership if we did not take reasonable steps to ensure the protection of these products. Like most organizations, the CAA/CAC uses the available mechanisms: policies, copyright, licensing agreements, and detailed contracts for contractors developing new intellectual properties, and other legal means to protect assets.

Let me present an example. If I were to take the CAA's Industry Training Programs instructional materials, repackage them and set up a business as Steve's Professional Avalanche Training School, all the while selling myself as a CAA Professional Member, I believe the membership would like to have a mechanism to address this situation. The Enterprise Conflict Avoidance Policy is intended to address such an issue

Last spring at the AGM, I introduced the board's concerns about the potential for this conflict to the membership and stated that, over the summer, the board would be developing a policy to address this. As we worked on this document, the board debated principles at length to achieve fairness and balance without stifling innovation and creativity. The following underlying principles are the foundation for the new Enterprise Conflict Avoidance Policy:

> **"...use your privilege as members to ask questions or challenge policy decisions."**

- Equal onus on the CAA/CAC and individual members to avoid intentionally jeopardizing the viability of each other's business enterprises and associated investments. The CAA/CAC should not undertake new programs or services that damage or compete with pre-existing programs or services offered by members, and vice-versa.
- Equal onus on the CAA/CAC and members to ask the other, in writing, if an enterprise under consideration could be harmful to existing programs or services being offered by the other party.
- Equal opportunity for the CAA/CAC and members to decide if an enterprise conflict does exist, and to ask the other party to refrain from undertaking their proposed enterprise.
- Equal opportunity for the CAA/CAC and members to permit the other party to proceed with their proposed enterprise because of its merit and benefit to the Canadian avalanche community.
- Should the CAA/CAC or a member proceed with an enterprise following the other party's written request not to undertake that enterprise, each have the right to have the matter resolved by a vote of the membership in accordance with the bylaws. This leaves the ultimate decision-making authority in the hands of the membership, not the board.

I assure you that our intent is to create a fair, transparent and respectful business environment that fosters innovation and encourages our members to flourish in their personal business efforts. And yes, one goal of the new policy is to protect the membership's interests and assets; that is what a board of directors is elected to do. CAA membership has its privileges, but also its obligations. One of the obligations includes not knowingly damaging the well being of the association.

In closing, I want to touch on fundamental CAA values. All members are accountable for their individual actions and decisions, and the board of directors is fully accountable to the membership for theirs. I encourage all of you to use your privilege as members to ask questions or challenge policy decisions. Constructive debate is healthy and keeps us strong, and the board needs to appreciate all perspectives as we pursue long-term successes.

Approved CAA/CAC Enterprise Conflict Avoidance Policy

1. Intent

This policy is intended to provide guidance to the CAA/CAC Board of Directors (Board), staff and members in circumstances where:

1.1. To support and assist the Canadian avalanche community the CAA or CAC has developed and offers products or services for sale, subscription or other compensation; and,

1.2. A CAA or CAC member, either individually or in concert with others, undertakes to develop and offer competitive products or services to the Canadian avalanche community for sale, subscription or other compensation; and,

1.3. The Member undertakes this development with knowledge of the pre-existing CAA/CAC products or services.

2. Background

The CAA and CAC have invested more than $1m of members' equity and other funds to develop products and/or services (here-after referred to as "property" or "properties") that support the CAA or CAC's purposes as stated in its constitution. The CAA/CAC offers these properties for sale, under license for use by third parties, or under other terms to recoup costs for property development, delivery and periodic renewal. Examples of properties that have been created in this context include Industry Training Program course materials, InfoEx, the Canadian Avalanche Information System, the Canadian Avalanche Data System, Observation Guidelines and Recording Standards for Weather, Snowpack and Avalanches, Avaluator, handbooks, and numerous other properties and publications.

Once the CAA or CAC has incurred the costs of developing and marketing a property, it may be possible for other parties to replicate that property and offer it to the Canadian avalanche community at a significantly reduced cost. This situation could threaten the CAA or CAC's financial health and therefore be contrary to the best interests of the CAA or CAC. The CAA Financial Principles Policy includes the following statement. "Except as approved by the Board of Directors, the CAA will not engage in business activities that damage or compete with the employment or business prospects of CAA members."

The Board holds that the inverse concept should also be true – "Except as approved by the Board of Directors, members will not engage in business activities that damage or compete with the business prospects of the CAA or CAC." This statement is based on the premise that when the CAA/CAC develops properties to support members, avalanche safety operations and the entire Canadian avalanche community, individual CAA/CAC members should not start up new enterprises that jeopardize the viability of existing CAA/CAC properties.

3. Enterprise Conflict Avoidance

3.1. If a CAA or CAC member proposes to undertake an enterprise that could conflict with an existing CAA or CAC property the member will inform the Board of the particulars and ask the Board to determine if their proposed enterprise has potential to jeopardize the CAA/CAC property's viability.

3.1.1. The Board will review the particulars of the situation and will respond in writing to the member with their decision.

3.1.2. If the Board determines that the member's proposed enterprise does not jeopardize the CAA/CAC property's viability the Board will inform the member that no conflict exists.

3.1.3. If the Board determines that the member's proposed enterprise does jeopardize the CAA/CAC property's viability, the Board may:

3.1.3.1. Inform the member that conflict does exist, and request that the member refrain from undertaking the proposed enterprise; or

3.1.3.2. Inform the member that conflict does exist, but in the opinion of the Board the proposed enterprise has merit and benefit to the Canadian avalanche community that overrides the potential jeopardy to the CAA/CAC property, and encourage the member to undertake their proposed enterprise.

3.1.4. A member who knowingly undertakes an enterprise that jeopardizes a pre-existing CAA/CAC property's viability, in contravention of the Boards written request not to undertake that enterprise may, at the discretion of the Board, be subject to expulsion from the CAA and/or CAC by a vote of the members according to the Bylaws.

3.2. If the CAA or CAC proposes to undertake an enterprise that could conflict with an existing property owned by a member the Board will inform the member of the particulars and ask the member to determine if the CAA/ CAC's proposed enterprise has potential to jeopardize the viability of the member's property.

3.2.1. The member will review the particulars of the situation and will respond in writing to the Board with their decision.
3.2.2. If the member determines that the CAA/CAC's proposed enterprise does not jeopardize the viability of the member's property the member will inform the Board that no conflict exists.
3.2.3. If the member determines that the CAA/CAC's proposed enterprise does jeopardize the viability of the member's property the member will inform the Board that conflict exists, and may request that the CAA or CAC refrain from undertaking the proposed enterprise.
3.2.4. If the CAA or CAC knowingly undertakes an enterprise that jeopardizes the viability of a pre-existing property owned by a member the member may have the issue resolved by a vote of the members at the next CAA or CAC annual general meeting or special general meeting, according to the Bylaws.

Current CAA properties

- InfoEx and associated software and support systems
- Canadian Avalanche Information System
- Canadian Avalanche Data System (CADS) – re branded in Oct 2007 to SnoInfoPLUS
- OGRS
- Industry Training Program and associated support materials
- SnoInfo
- CAA Markup Language
- CAA wordmark and logos

Current CAC properties

- AST curriculum and associated support materials
- Avaluator
- CAC website
- CAC avalanche incident database
- CAC wordmark and logos

Approved: CAA / CAC Board of Directors on October 11, 2007
Effective: Immediately

Al Safrata

To: The OGRS Working Committee

OGRS 2007 is now "in the can" and, on behalf of the CAA Technical Committee, I would like to extend a big thank you to the members of the OGRS Working Group. As an organization, we can be proud of our ability to bring together wisdom from diverse disciplines in order to work together for our mutual benefit. It is not always easy to achieve consensus on these high level issues, but it certainly has great rewards. OGRS is highly regarded world-wide, as a result of your input.

As you will see in the final document, the technical committee was not able to incorporate every good suggestion from the working group. We gave ourselves strict criteria for changes, and not all suggestions were able to meet these criteria. This meant that certain proposals had to be dropped for this edition. We see OGRS as the home of well proven standards that are firmly grounded in good science. This means that OGRS represents a staid repository of knowledge, not the cutting edge of research and development.

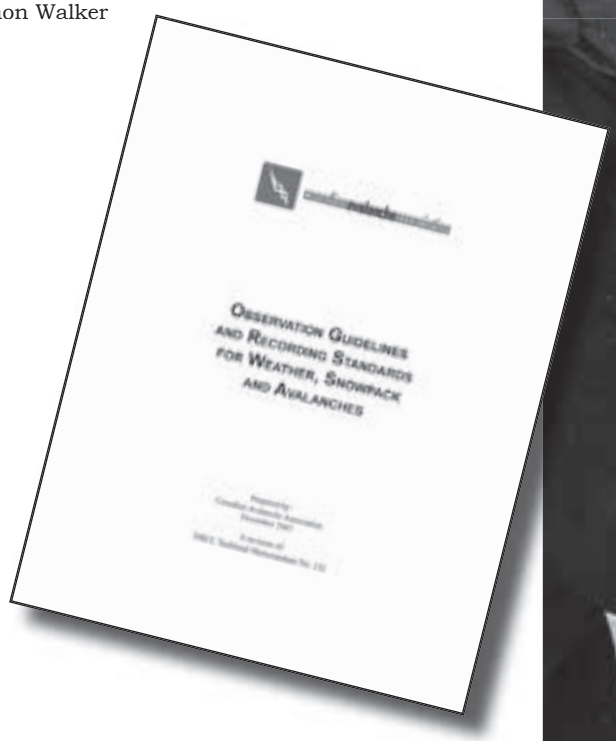
This being said, the working group's suggestions will give impetus for future research into areas such as:

- Relative size classification scale for avalanches
- Research into new field tests (e.g. fracture propagation)
- New thinking around avalanche hazard and risk

Thanks again for your hard work and dedication, and congratulations to Bill and Cam for leading the effort.

Yours Truly,
Rob Whelan
Chair, CAA Technical Committee

OGRS Working Committee
Cam Campbell (Project Coordinator)
Bill Mark (Chair)
Scott Aitken
Steve Conger
Jeremy Cox
Dave Gauthier
Jeff Goodrich
Mark Klassen
Mike Rubenstein
Chris Stethem
Ilya Storm
Simon Walker



Ian Tomm

International Commission for Alpine Rescue (ICAR)

Report on the ICAR Avalanche Commission October 17-20 2007 at Pontresina, Switzerland

By Clair Israelson

The annual congress of the International Commission for Alpine Rescue (ICAR) engages four separate working committees or "commissions"—air (helicopter) rescue, avalanche, mountain emergency medicine and terrestrial rescue. The avalanche commission is chaired by Hans-Jürg Etter of the SLF, the Swiss Federal Institute for Snow and Avalanche Research. As a member of this commission, I head a working group on international best practices for avalanche accident prevention.

Corvatch Field Trip

Wednesday, October 17th was a field day on the Corvatch Glacier above St. Moritz. At nearly 11,000 feet above sea level there was snow on the glacier, allowing for reasonable avalanche rescue simulations. We had an opportunity to use the latest transceivers and other products from Barryvox, Pieps, Ortovox and Tracker in both single and multiple burial situations. Over the course of the day it became obvious that transceiver technology has advanced a lot over the past few years but, in my opinion, so far no manufacturer is producing the perfect transceiver. Nonetheless, we saw some interesting new features that are worth noting.

Barryvox has incorporated a motion sensor that detects the heartbeat of a buried victim, allowing rescuers to identify and prioritize their shoveling efforts for buried victims that are still alive. Pieps has upgraded their software for a longer transmit range and more precise receiving functions. They have also produced a "smart probe" that can temporarily cancel the transmitted signal when it comes within close proximity to a buried beacon, simplifying close proximity multiple beacon searches. The Ortovox S1 has improved and simplified controls, and has the best visual display currently available. Backcountry Access continues to offer robust, easy to use transceivers that attract praise from avalanche professionals disenchanted with "high-tech" devices that come to market half baked. The new carbon fiber probe from that company also deserves a serious look—check it out!

SnowPulse demonstrated their latest floatation device, now incorporated into a backpack. This device is interesting in that it inflates a collar around the chest, neck and head, adding impact protection to these vital areas of the human body. Limited commercial distribution is planned for SnowPulse devices in selected European locations this year.

RECCO demonstrated their latest generation of receiver, which has been modified to pick up signals from RECCO reflectors as well as avalanche transceivers. The new RECCO receivers are light, robust, and now have a longer battery life. Live recoveries of avalanche victims have now been achieved using RECCO. If you belong to an organized rescue group you should give this product a test drive—these searching devices are provided free to bona fide SAR teams!

A truly innovative use of search dogs was demonstrated. The dog carried a pack containing a transceiver on one side

The new generation of the RECCO receiver can pick up signals from transceivers as well as other RECCO reflectors.

Clair Israelson

of its body, and a transmitting radio on the other. When the transceiver carried by the dog picks up the audible transceiver signal of a buried victim, the dogmaster hears the signal and gives verbal commands to the dog to search in a particular direction to further isolate the transmitter. In this way the dog uses its superior speed and agility on avalanche debris to the greatest advantage, allowing human rescuers to know the general location of where the buried person(s) are so they can go directly to there..

In the afternoon we had hands-on practice of specialized transceiver search techniques: three-axis orientation, micro-strip searching and the three-circle method. It is important for avalanche professionals to know when and how to use these techniques. We have to practice these techniques frequently, otherwise they do not imprint into our brains and are not available when we need them most—in a real rescue situation.

I particularly appreciated the session on rescue shoveling. This year at the ICAR meetings there were several presentations on what experienced rescuers already know—that the transceiver search portion of an avalanche rescue is almost always straightforward and fast. The hardest, most time consuming part of the rescue is shoveling to access the buried victim. The V-conveyor method, developed by Manuel Genswein, is the most efficient, well thought-through system for extricating buried avalanche victims quickly that I have encountered. For details, go to the Knowledge Centre on the CAA website.

Avalanche Commission Discussion Items

This year there were 55 representatives from 17 countries participating in the proceedings of the ICAR Avalanche Commission. A summary of discussion items and presentation topics follows.

Standardized Search Strip Width for Transceivers Defined

For several years the ICAR Avalanche Commission has been urging transceiver manufacturers to refrain from advertising a "maximum range" for their transceivers because, due to the signal coupling characteristics of multi-antenna transceivers, this advertised maximum range is seldom achieved in real life situations. ICAR avalanche commission members were concerned that if searchers used a search-strip width twice the manufacturer's advertised maximum range, many buried victims could be passed undetected, resulting in unnecessary loss of life. The manufacturers responded with a variety of explanations why they could not, individually or collectively, state the most effective search-strip width for their respective products.

In 2006 the ICAR Avalanche Commission asked Jürg Schwiezer, a respected avalanche scientist from the SLF, to investigate this issue. His paper is posted on the Knowledge Centre of the CAA and CAC websites, and I urge you to read it carefully so that you appreciate the variables he considered and methodology used to calculate an optimum search-strip width for modern avalanche transceivers. Jürg concludes that for multi-antenna transceivers, the effective range is about 50% of the maximum range. Thus, the recommended search-strip width is equal to the maximum range of the transceiver being used, assuming 50% to either side of the rescuer.

Based on this analysis, Jürg recommends that we should use a search-strip width of 40 metres for modern transceivers. Previously, some transceiver manufacturers were promoting search strip widths of only 20 metres, or 10 metres on each side of the searcher. This new standard for search-strip width will double the area a searcher can cover per unit of time. This will reduce search times and save lives!

> **"...for multi-antenna transceivers, the effective range is about 50% of the maximum range."**

It was interesting to learn that Manuel Genswein, in a separate effort, was developing a sophisticated computer simulation to calculate the optimum transceiver search-strip width. Initial results from Manuel's work suggests that even the 40 metres recommended by Jürg Schweitzer may be conservative, and that adopting a 50 metre search strip width may provide the optimum net benefit in avalanche rescues. Manuel will continue his work in the upcoming year and report results in 2008.

Avalanche Accident Prevention "Best Practices" Project

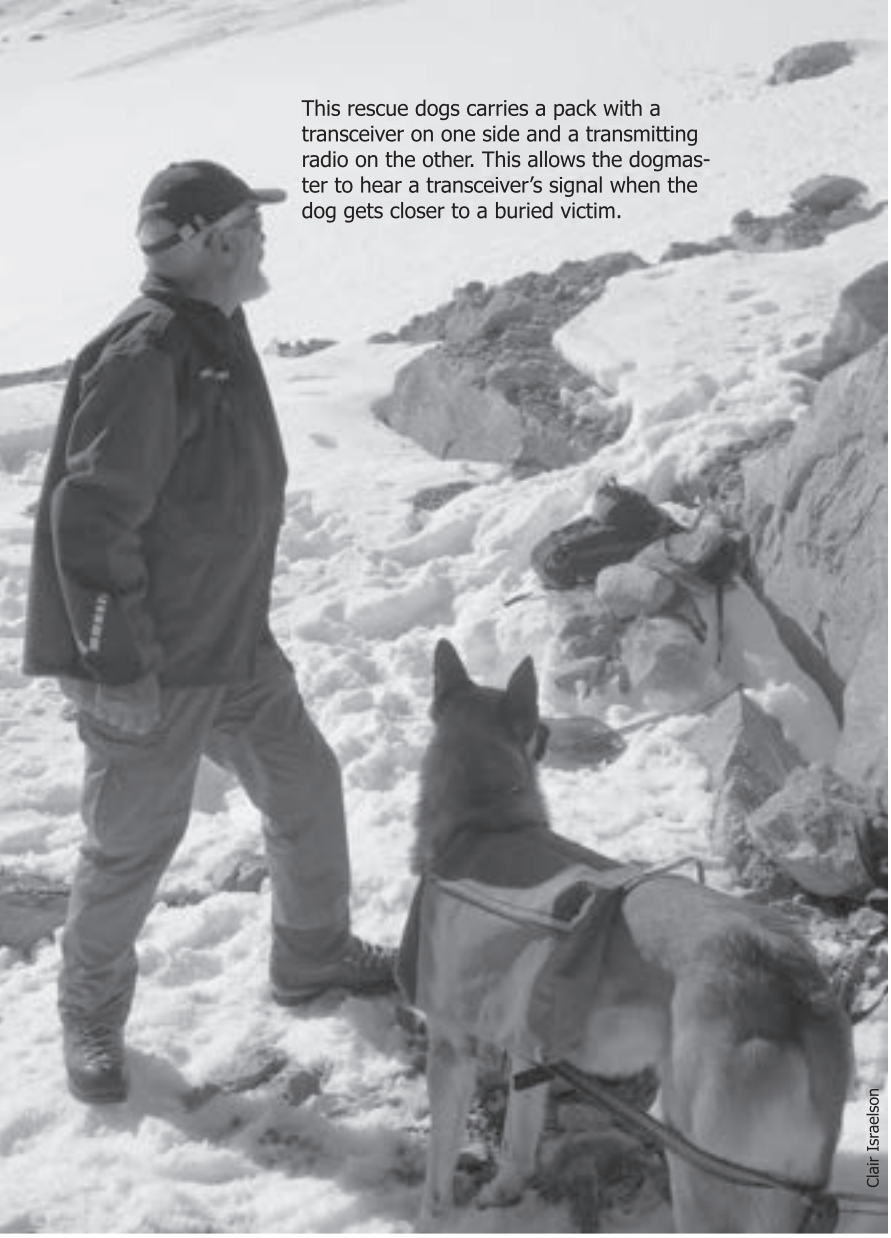
I reported on the results to date. Respondents from 12 countries provided information about national avalanche programs in five general categories of accident prevention programming:

- Public bulletins and avalanche warning services
- Public education / awareness programs for amateur recreation
- Protection for public infrastructure (villages, roads, rail lines, built facilities)
- Safety and training programs for avalanche professionals (guides, ski patrollers, etc.)
- Avalanche rescue services

Next steps in the project are to have other national representatives validate the survey results received, and update the database so the information is as complete and comprehensive as possible. We will then compare the national programs with the ICAR avalanche fatality database to determine if there is any evidence to show if a particular category of safety programming is effective in saving lives. We expect to have initial results available to report by the fall of 2008.

Avalanche Glossary Project

The English-French translations are complete, and specific terms in other languages will continue to be updated as



This rescue dogs carries a pack with a transceiver on one side and a transmitting radio on the other. This allows the dogmaster to hear a transceiver's signal when the dog gets closer to a buried victim.

Clair Israelson

information becomes available. The goal is to have a multi-lingual glossary on the ICAR website (www.ikar-cisa.org) available for everyone to use. The Canadian English-French translation project received special mention for its usefulness in this international effort.

Avalanche Rescue Dog Working Group Report

This group met in Leogang, Austria from June 1-7, 2007, in response to the request at the Slovenia conference to revive periodic avalanche search dog training and knowledge transfer between ICAR countries. Participants focused on techniques for searching difficult terrain, including lost persons in alpine terrain, and use of GPS in dog searching. Participants concluded the course was very intensive and provided a great deal of new knowledge. The goal is to schedule rescue dog training courses every second year. Canadian organizations with avalanche search dogs (RCMP, Parks Canada, CARDA) were encouraged to participate.

Notable Avalanche Accident Reports

Hans- Jürg Etter noted that the total number of reported avalanche fatalities in ICAR member countries during the 2006-07 reporting period was about 100, down substantially from the average of 160 fatalities per year. This decrease was attributed to an unusual winter with very little snow in the European Alps.

The representative from Lichtenstein reported on an accident where a ski tourer, equipped with an ABS floatation device, triggered an avalanche. He deployed the ABS and ended up on the surface of the deposit with his upper body and ski tips fully visible. A second, sympathetically triggered avalanche then released in an adjacent gully, fully burying the man. Rescuers observed the event and arrived on site quickly but could not locate the man because his transceiver was in his pack, turned off. He was eventually located by probing, and recovered deceased. Lesson for us all—where possible we should advocate using flotation devices in combination with transceivers.

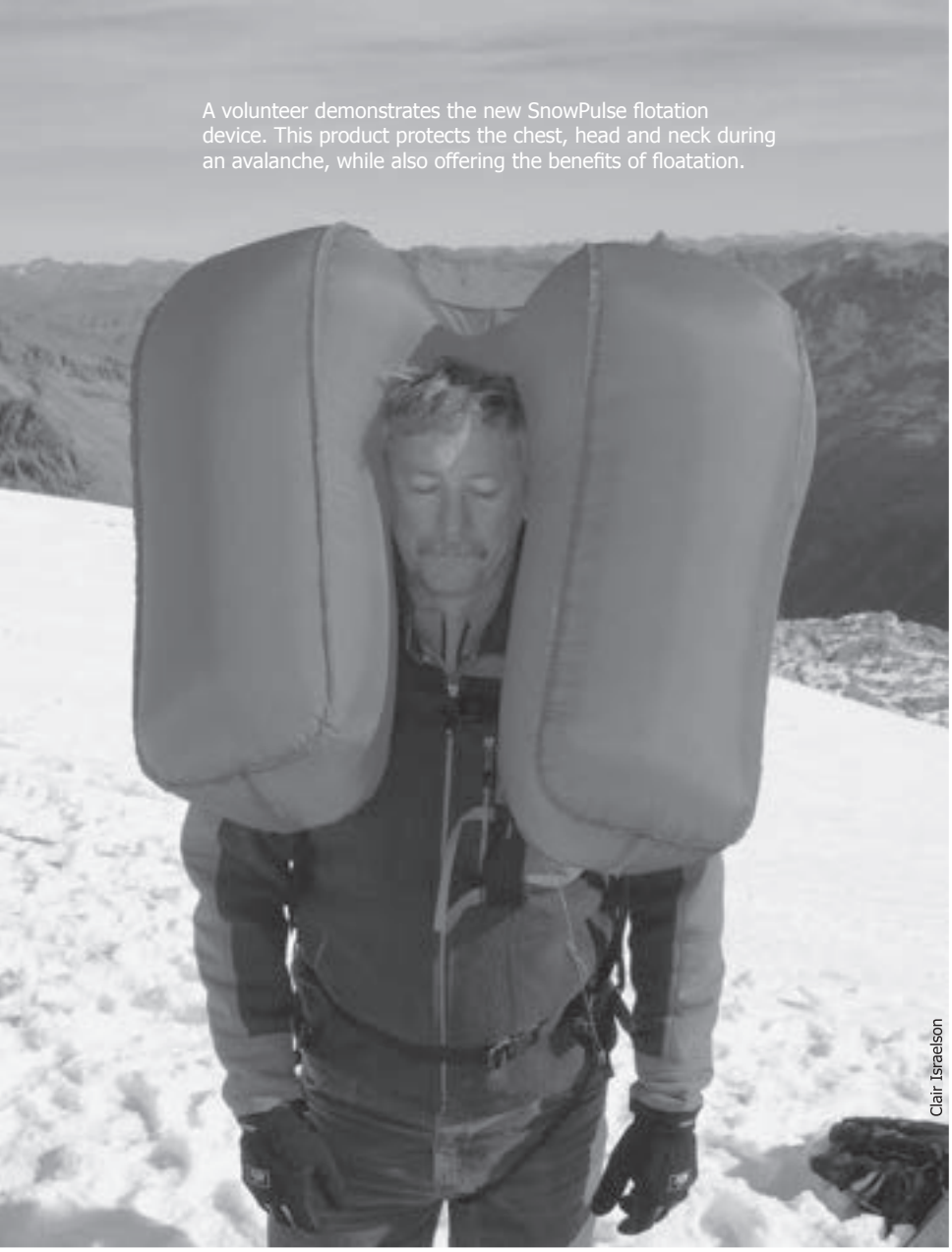
Dr. Herman Brugger reported on an avalanche last spring in Italy where a lightly clad ski tourer was buried approximately three metres deep. He was recovered unconscious but with an air pocket near his head, non-breathing and apparently hypothermic after 100 minutes. The rescue team immediately started basic life support. He was heli-evacuated at 140 minutes, and went 15 minutes by helicopter without chest compressions. Chest compressions were restarted at a primary care facility at 165 minutes; when the patient arrived at a hospital they started re-warming him 235 minutes (nearly four hours!) after the time of burial. The patient recovered fully, with no residual physical or mental degeneration, and was discharged from hospital 14 days after the avalanche. The take home story—if the patient has an air pocket and is hypothermic, don't give up with basic life support in the field, or advanced life support at the hospital, until the patient is fully re-warmed!

Norwegian "National Standards" for Avalanche Rescue

The Norwegian Red Cross reported on their work developing a national standard applicable to all professional and volunteer avalanche rescue resources. This standard will help ensure that avalanche rescues are conducted expeditiously, without confusion over roles, responsibilities, or techniques to be employed. I was impressed by this work, as there may be application for this concept in Canada

A Voice Urging Improved Technical Specifications for Transceivers

Patrick Girardon of NIC-IMPEX, the manufacturer of the ARVA transceiver, made a strong presentation urging that all transceiver manufacturers should work together to improve and standardize technical specifications transceiver technology, so all models of avalanche transceivers have optimal interoperability performance 100% of the time. At present each manufacturer has slightly differing technical specifications for turning the units on and off, allowable frequency variations of



A volunteer demonstrates the new SnowPulse flotation device. This product protects the chest, head and neck during an avalanche, while also offering the benefits of floatation.

Clair Israelson

up to 0.160 mHz around 457, signal frequency wander in cold conditions, and other characteristics of the transmitted signal. Patrick called for all companies to work together to develop a new, much stricter EU technical norm for transceivers so that performance and reliability can be increased across the board. There was strong delegate support for his position.

Avalanche Ball

Manufacturers of the "avalanche ball" showed a movie describing their product. It is a simple spring-powered mechanical device contained in a pouch that can be attached to any backpack. When the wearer is caught in an avalanche they simply pull the trigger loop, and the ball is ejected from the carrying pouch and the ball opens. The ball is attached to the skier by a cord. The ball floats on the surface of the avalanche and if the wearer is buried, searchers can follow the cord to the victim, reducing searching times. In 16 reported avalanche events involving persons wearing the device, the avalanche ball was visible on the surface 87% of the time. For more information visit www.lawinenball.at.

ABS (Avalanche Balloon System) Device

This year ABS did not formally present on their technological upgrades, but were present at the ICAR trade show where they demonstrated their products to delegates. ABS pioneered the avalanche floatation concept, and their latest innovations are designed to make their product useful to a broader segment of the market. ABS now manufactures a frame unit housing the airbags, inflation canister and triggering device. The frame unit can be used by itself, or with several different sizes and styles of bags that can be zipped onto the frame unit, increasing versatility. Peter Aschauer, the owner of ABS assured me that this season ABS inflation canisters will be manufactured in North America, meeting all Canadian and US certifications and will no longer be designated as "dangerous goods" by Transport Canada. I have not personally seen these new inflation canisters, but when they become available I suspect we will see this ABS used more widely in Canada, as it currently is in Europe.

SnowPulse Floatation Device

This relatively new product is now entering limited production and will be commercially available in selected European markets this coming winter. This floatation device offers impact protection for the chest, head and neck, has inflation canisters that can be refilled by the user, is light weight—only 1.3 kg. A possible disadvantage is limited visibility when the device is inflated. In North America, another disadvantage is that they are unavailable at this time. In my opinion this product holds significant promise. I believe in the years to come, floatation devices (ABS, SnowPulse, and other similar products reportedly under development) may be seen as the preferred avalanche safety technology because they effectively prevent burial.

Risk Management in Avalanche Rescue Operations

Krister Kristensen, avalanche specialist from the Norwegian Geological Institute gave a very thoughtful presentation on risk management in avalanche rescue operations. His premise is that SAR managers should consciously evaluate the risks and benefits of inserting rescuers into dangerous winter mountain environments. In his presentation he suggests a process that avalanche SAR managers could use to accomplish this task. You can view his presentation at the Knowledge Centre on the CAA website. If readers have comments on this suggested risk management process for avalanche SAR in the Canadian context, please send your thoughts to Ken Wylie, eTraining Curriculum Developer at kwylie@avalanche.ca.

NSS Certificate of Achievement

CAA Recognized for 25 Years of Dedication to Avalanche Safety

On October 18, 2007, the CAA received a Certificate of Achievement Award in tribute to the organization's many years of commitment to avalanche safety in Canada. The award was presented by the National Search and Rescue Secretariat (NSS) at their annual SARSCENE Conference, held this year in Victoria, BC.

Géraldine Underdown, Executive Director of NSS, presented the award to CAA President Steve Blake. "The strength of Canada's avalanche community is the result of a strong tradition of collective effort and collaboration by numerous organizations," said Ms. Underdown. "The Canadian Avalanche Association is responsible for this proud tradition that is the envy of alpine countries around the world."

In receiving the award, Steve Blake acknowledged the generous financial support provided by the NSS and their New Initiatives Fund (NIF) program, which has provided nearly $4 million in research and development funding for avalanche safety projects since 1991. "The NIF program is by far the largest single financial contributor to the development of avalanche safety programs in Canada," said Steve. "Without this federal initiative, Canadian avalanche programs would still be in the dark ages."

Steve also paid respect to the contribution of Parks Canada, in particular National Public Safety Specialist Michel Villeneuve. "All NSS projects require a federal agency to support the project and oversee the work," he said. "Over the years Michel has served in this role and we are deeply indebted to him for his unflagging assistance."

In his closing remarks, Steve recognized the work of the staff at the CAA's office in Revelstoke, especially the leadership of Executive Director Clair Israelson, Operations Manager Ian Tomm and CAC Operations Manager John Kelly. "These three demonstrate the commitment to excellence that allows us to pursue our vision—to be a world leader in avalanche awareness, education and safety services."

The Knowledge Harvest

An eTraining Mini Update

By Ken Wylie

In recent issues of *avalanche.ca* there have been several articles outlining the eTraining project and what it means for avalanche search and rescue in Canada. The project has gone through a content development phase where we have established best practices for winter mountain travel (WinterSafe) and avalanche search and rescue (AvSAR). Starting this spring, we will develop an avalanche search and rescue management module.

Early last September, the content manual for the first two modules was completed, thanks to the efforts of many subject matter experts, advisors and managers who have reviewed and approved the document. (see "eTraining Makes a Name for Itself" in *avalanche.ca*, Vol 82, Fall 2007). Now the project has moved into the development phase. What this means is programmers will begin building the digital platforms for the course and the educators will develop and hone the methods of delivery.

Much of the content for the online courses will be delivered in scenarios. The learner (at various levels) will enter a randomly generated avalanche scenario and will be immediately faced with having to respond to the challenges of ensuring their own safety as well as rescuing the victims in the situation. Few learners will do well right from the start, but they will work out how to improve their performance by accessing content tutorials.

Each time they begin a scenario, it will differ in some way, giving learners little opportunity to "wire" the program. Each time the learner completes the scenario they will gain valuable experience that will have a high level of transference to field operations. Much like a flight simulator, each of the scenarios is based on real-life events, without recreating the exact situation.

Coming up with a variety of real-life events was a fascinating process of its own. On November 26th and 27th the project took a shot in the arm. We collected a large group of avalanche response specialists, university professors, graduate students and digital graphic design specialists at the University of Calgary. We met with the aim of harvesting the knowledge of the avalanche response specialists, by having them tell stories of situations they have responded to throughout their careers.

While the avalanche response specialists were speaking their stories, Dr. Hanan Yaniv extracted themes from their stories. These themes will form the basis for the avalanche response simulator. We heard numerous stories over the two days. The event not only served to create the basis for the avalanche response simulator, it also served to provide a context for the developers as we move into the development phase of the project. It was a very educative process for all those involved and everyone commented on the power of the experience.

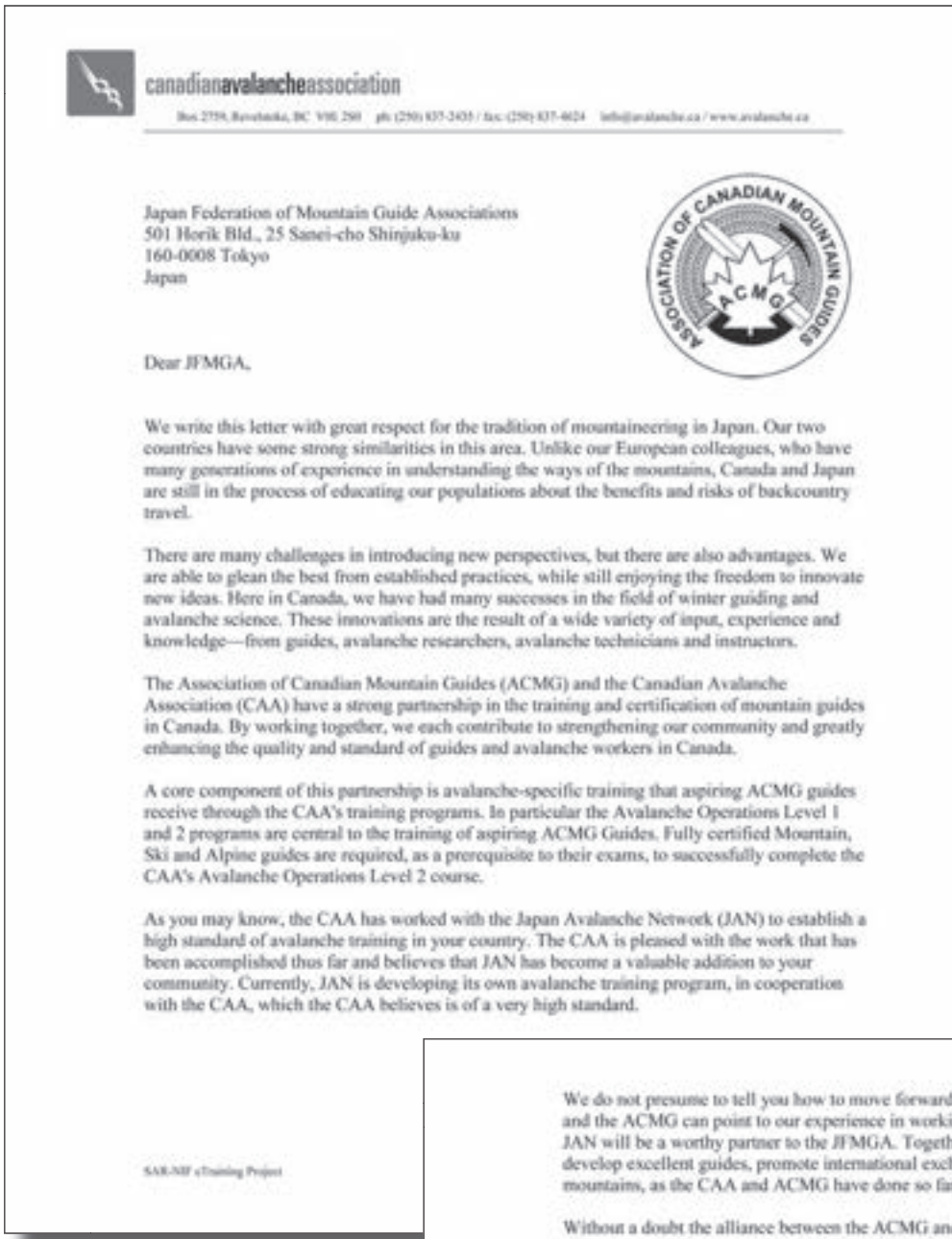
The eTraining project is scoring a hat trick. It involves cutting-edge avalanche search and rescue technique, cutting-edge educational theory, and cutting-edge computer technology. It is all very exciting.

>> Ken Wylie is the Lead Content and Curriculum Developer for the eTraining Project

Ken Wylie

Cross-Cultural Connection

At the request of our friends from the Japan Avalanche Network, the CAA and the ACMG worked together to produce this letter to the Japan Federation of Mountain Guides Associations. We hope our example of collaboration between our two organizations serves as proof once again that the whole is always greater than the sum of its parts.



canadianavalancheassociation

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Japan Federation of Mountain Guide Associations
501 Horik Bld., 25 Sanei-cho Shinjuku-ku
160-0008 Tokyo
Japan

Dear JFMGA,

We write this letter with great respect for the tradition of mountaineering in Japan. Our two countries have some strong similarities in this area. Unlike our European colleagues, who have many generations of experience in understanding the ways of the mountains, Canada and Japan are still in the process of educating our populations about the benefits and risks of backcountry travel.

There are many challenges in introducing new perspectives, but there are also advantages. We are able to glean the best from established practices, while still enjoying the freedom to innovate new ideas. Here in Canada, we have had many successes in the field of winter guiding and avalanche science. These innovations are the result of a wide variety of input, experience and knowledge—from guides, avalanche researchers, avalanche technicians and instructors.

The Association of Canadian Mountain Guides (ACMG) and the Canadian Avalanche Association (CAA) have a strong partnership in the training and certification of mountain guides in Canada. By working together, we each contribute to strengthening our community and greatly enhancing the quality and standard of guides and avalanche workers in Canada.

A core component of this partnership is avalanche-specific training that aspiring ACMG guides receive through the CAA's training programs. In particular the Avalanche Operations Level 1 and 2 programs are central to the training of aspiring ACMG Guides. Fully certified Mountain, Ski and Alpine guides are required, as a prerequisite to their exams, to successfully complete the CAA's Avalanche Operations Level 2 course.

As you may know, the CAA has worked with the Japan Avalanche Network (JAN) to establish a high standard of avalanche training in your country. The CAA is pleased with the work that has been accomplished thus far and believes that JAN has become a valuable addition to your community. Currently, JAN is developing its own avalanche training program, in cooperation with the CAA, which the CAA believes is of a very high standard.

SAR-NIF eTraining Project

We do not presume to tell you how to move forward in your organization. However, the CAA and the ACMG can point to our experience in working together and the CAA can advise that JAN will be a worthy partner to the JFMGA. Together you will have an improved ability to develop excellent guides, promote international exchanges and contribute to safety in the mountains, as the CAA and ACMG have done so far.

Without a doubt the alliance between the ACMG and the CAA has brought benefits beyond what either organization ever anticipated. If our Canadian tradition of sharing knowledge can serve as a model, we would be very honoured.

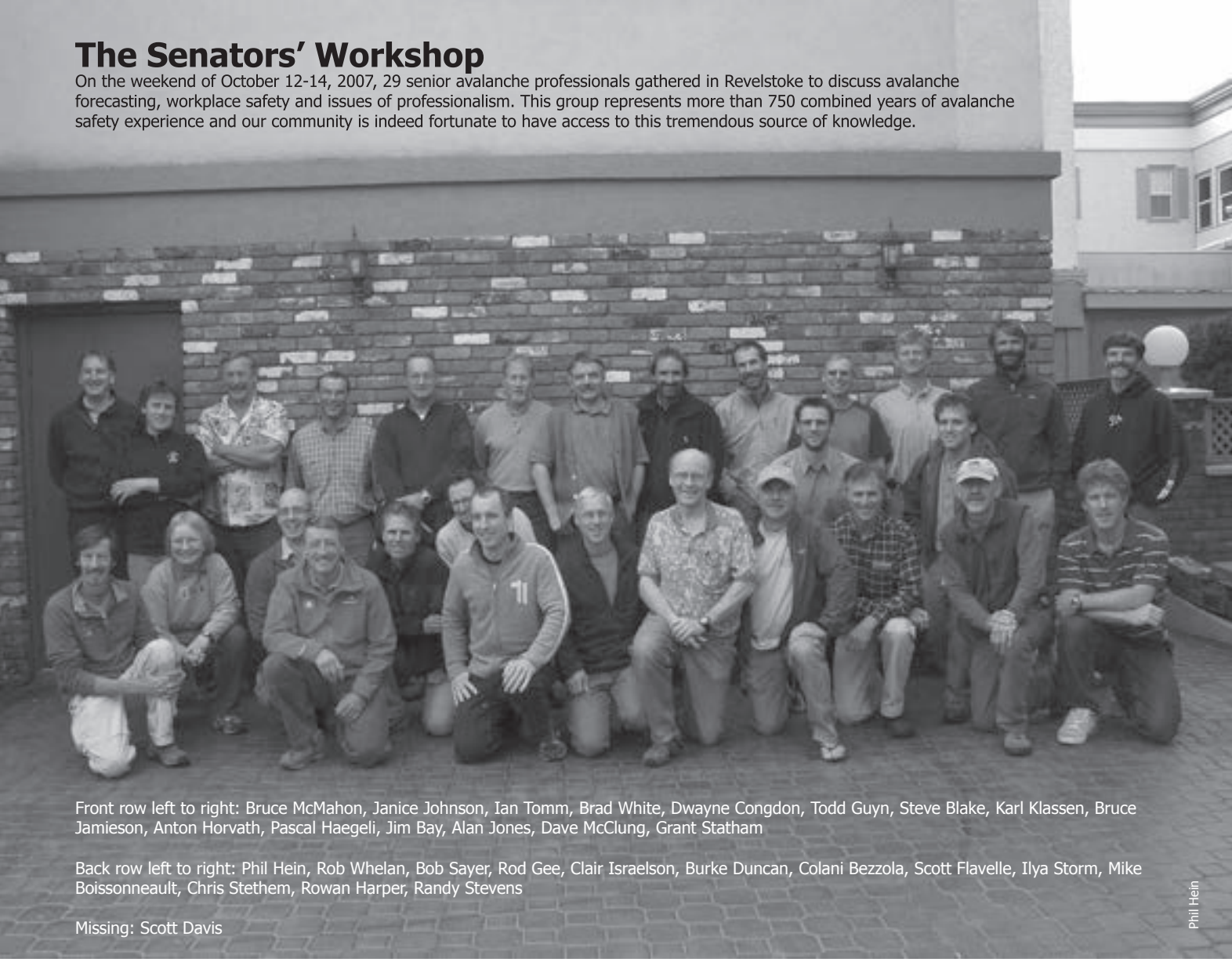
Yours truly,

Scott Davis, IFMGA
President
Association of Canadian Mountain Guides
sdavis@alpineadventure.com

Clair Israelson, IFMGA
Executive Director
Canadian Avalanche Association
clair@avalanche.ca

The Senators' Workshop

On the weekend of October 12-14, 2007, 29 senior avalanche professionals gathered in Revelstoke to discuss avalanche forecasting, workplace safety and issues of professionalism. This group represents more than 750 combined years of avalanche safety experience and our community is indeed fortunate to have access to this tremendous source of knowledge.



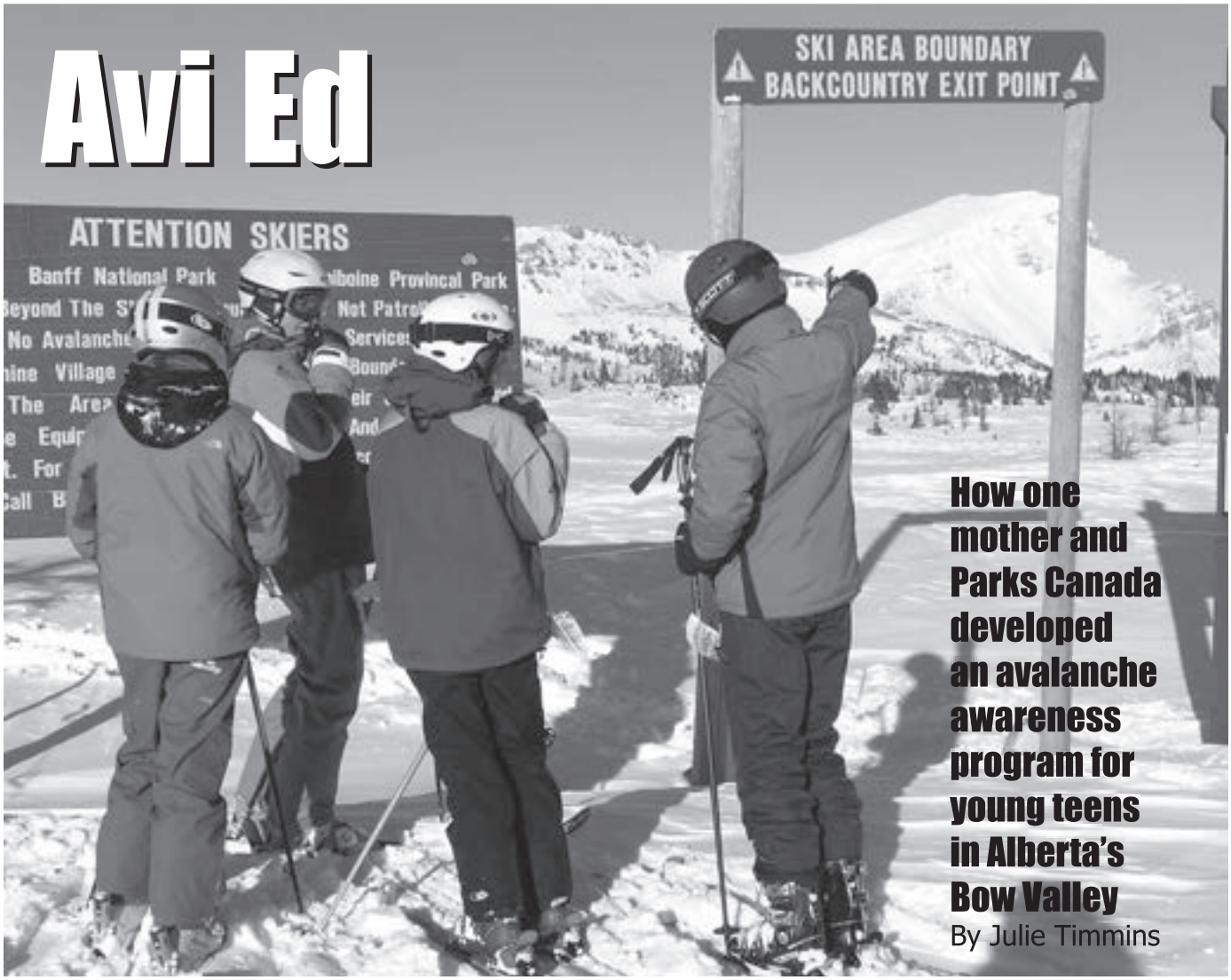
Front row left to right: Bruce McMahon, Janice Johnson, Ian Tomm, Brad White, Dwayne Congdon, Todd Guyn, Steve Blake, Karl Klassen, Bruce Jamieson, Anton Horvath, Pascal Haegeli, Jim Bay, Alan Jones, Dave McClung, Grant Statham

Back row left to right: Phil Hein, Rob Whelan, Bob Sayer, Rod Gee, Clair Israelson, Burke Duncan, Colani Bezzola, Scott Flavelle, Ilya Storm, Mike Boissonneault, Chris Stethem, Rowan Harper, Randy Stevens

Missing: Scott Davis

Phil Hein

Avi Ed



How one mother and Parks Canada developed an avalanche awareness program for young teens in Alberta's Bow Valley

By Julie Timmins

At approximately 2:00 in the afternoon on a sunny November day in 2006, two young teenagers were enjoying the day skiing in the WaWa area of Sunshine Ski Resort. The two boys spotted a number of other people skiing in what is commonly called WaWa Bowl, a popular backcountry destination some distance beyond the ski area boundary. It looked like great skiing.

They had seen the signs posted at the ski area boundary but had never read the information. The signs, posted by Parks Canada and Sunshine Ski Resort, warn readers that if they pass, they are leaving the ski area and heading into avalanche terrain. One sign asks, "Do you have a shovel, probe and transceiver?" The boys, with their eyes on the far away skiers, hefted their skis on their shoulders, walked through the gate, past the signs and started the long trek over to WaWa Bowl.

In addition to being a Park Warden, I am an ACMG Assistant Winter Guide and a schoolteacher. I am also the mother of one of these boys. In great shock, I realized that I had never taken the time to explain ski area signage to my own son.

Our kids know that their father and I have close connections with the avalanche world. Their father is a well-known mountain guide and sits on the board of the CAA. Many times we have talked about avalanches and avalanche safety. Yet here was our son, leaving the ski area, walking past warning signs and heading into backcountry avalanche terrain—without any formal avalanche training, without rescue equipment, and without question.

As a result of this incident, I quizzed a number of kids and discovered a shocking reality. These kids, many of them born and raised in the mountains of the Bow Valley, had no idea what the ski area signs meant and what the risks were when they traveled in to uncontrolled avalanche terrain. An avalanche awareness program for kids in the Bow Valley had been on my mind for several years but it wasn't until this incident that I realized that such a program needed to happen now. It couldn't wait any longer.

I took an idea to my manager at the Banff Warden Office who was fully supportive of the initiative. An avalanche awareness program presented by a park warden would reflect Parks Canada's commitment to youth education in avalanche safety. A major goal would be the reduction in avalanche-related fatalities through early avalanche awareness education. I then

went to the Superintendent of the Canadian Rockies School District who needed no convincing and wondered how soon I could start.

With the support of management I created Avi-Smart. My objective was to develop avalanche awareness in an age group on the brink of independence, venturing further from the guidance of their parents and engaging in a wide variety of outdoor winter activities that may expose them to avalanche danger.

Avi-Smart is an 80-minute program developed for all students enrolled in grades 7-10 in the Bow Valley. As a parent, I know that by the age of 12, kids want to be free of their parents and ski with their friends. That's why I decided to target that age group.

The first year of presentations occurred in February 2007. I felt it was important to reach every student in the Bow Valley and not just specific grades, classes or groups. I thought the best way to do it would be as a "guest speaker" visiting every classroom in the district. As most of the students have never received any avalanche awareness training, the grade 7 program was delivered to grades 7-10. Presentations were made to 29 classrooms and 648 students. This represents 88% of the student enrolment (the remaining 12% were absent on the days of the presentations).

The grade 8 program is now developed. The second round of presentations started November 15th, 2007 with the grade 7s getting their program, and the grade 8 program being delivered to the grade 9s and 10s. Each year of this graduated program builds upon the previous year's material. In addition to a 60-70% review, new information will be presented in each successive grade. Once fully established, each grade will have its own 80-minute presentation.

All presentations are indoors. There is no fieldwork. I let the kids know there are great courses out there, and if they want more hands-on experience that's what they should do. Parks Canada is committed to maintaining this program in the Bow Valley and would like to expand it to include other communities in or adjacent to the mountain parks.

A final note on those two boys who ventured out-of-bounds. Walking was difficult and they soon realized they would never reach their destination before the end of the day. They turned around and returned to the ski area, giving us all a happy ending for that story, and a great beginning for this program.

>>Julie Timmins is a warden in Banff National Park.

Julie Timmins collection

Julie Timmins presents her Avi-Smart program to a Grade 7 class at Banff Community High School

Key concepts in the Avi-Smart grade 7 program:

- A description of what an avalanche is—snow, slope, trigger
- A basic description of a snowpack and snow layers; the concept of a slab
- A prop that demonstrates the effect of slope angle is used and includes student participation
- The importance of getting trained, taking a course and the role of rescue equipment
- Ski area signage (permanent and temporary closures) and a description of in-bounds and out-of-bounds
- Ski area boundary signs, and Parks Canada signage at backcountry access points
- Peer pressure and its influence on decision making
- The importance of self-rescue
- A scenario involving a formal rescue with a probe line and dog
- A scenario involving a quick recovery with transceivers
- A portion of the SnowSmart video that focuses on avalanche safety
- Accessing information on the internet via avalanche.ca and how to find out about courses

AVALANCHE EDUCATION AND Revelstoke's New Resort

By Verena Blasy

The Youth Avalanche Education Program is now into its second year in Revelstoke. The program began last April when Revelstoke Mountain Resort (RMR) donated some funds to the CAC to start the program. This year we are happy to start earlier in the ski season in order to increase the impact of the programs.

Our focus right now is to reach all of the young skiers and boarders in town before the new ski hill opens in Revelstoke. Opening day on the hill coincides with the first day of Christmas break for students and many of them will be on the slopes from day one.

Their ski hill has grown a lot in the past year—from 1000 vertical feet to 4735, from 170 acres to 1500, and from no alpine terrain to more than 10 runs in the alpine. All this extra terrain means a lot more fun, but also more hazards. There are large treed areas in-bounds where lost skiers and tree wells will be a concern. There will be avalanche control on the hill and therefore the occasional temporary closure on runs familiar to students. And perhaps our biggest concern is the easy access to out-of-bounds terrain that students will suddenly have.

The out-of-bound areas accessible from the top of the chairlift are in some serious avalanche terrain. I personally know many people who have bought passes largely to access this "slack-country," so there is sure to be tracks going past the ski area boundary signs and tempting front-country skiers into the fresh powder.

Students don't necessarily know the difference between a closed area and an out-of-bounds area. They may not realize that going out of bounds is the same as going into the backcountry. They are often unaware that the people they see going out of bounds are (hopefully) equipped with beacons, shovels, probes, maps, climbing skins or snowshoes and some knowledge and training about avalanches. These are the main points we are trying to address in these first presentations.

The three big messages I hope to get through to the students before they hit the slopes are:

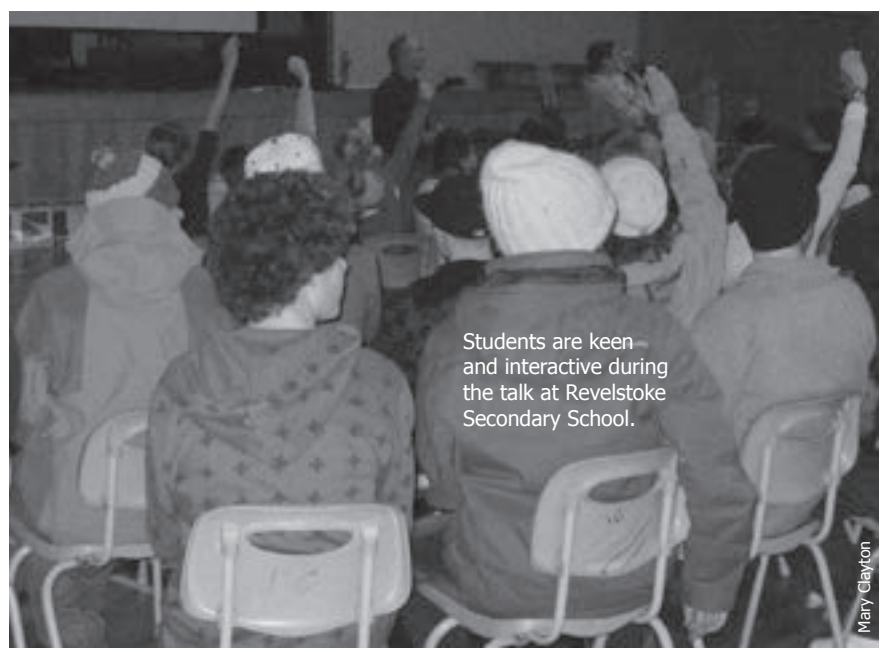
- Ski with a buddy
- Never go into a closed area
- Out of bounds = Avalanche terrain

I am currently working with Ken Gibson, a volunteer ski patroller, on this first school program. Before the ski hill opens we will be presenting to an estimated 150-200 students of all grades at Revelstoke Secondary School. We will also present to the grade 6 and 7 students at all four of the elementary schools as these students may also be skiing on the hill without a parent.

In the New Year, I will continue to offer grade 6 and 10 classes the programs that were developed and offered last spring. These programs will also be travelling to schools in Golden. In addition to these two programs I will be trying new lessons at a variety of age levels. I will be taking a grade 4 class out to do a lesson on avalanches for their weather unit. I plan to offer beacon searches to some of the high school PE classes. I will be creating a lesson and class discussion around the movie *A Dozen More Turns* for the Planning 10 students' unit on risk. I also hope to be running fun activities at all of the elementary snow sports days.

So far, most of the work I have done this season has been on a computer or phone. I'm excited to return to the schools to interact with the kids again, and learn more about their skiing and boarding habits. I hope that our messages reach them, and that they all have a superb and safe season recreating outside this winter.

>>Verena Blasy is the CAC's Youth Education Coordinator



Students are keen and interactive during the talk at Revelstoke Secondary School.

Mary Clayton

Terry Winkler

Tradition and Technology

Parks Canada and the CAC rebuild avalanche awareness in Nunavut

By Andrew Maher

In March 2008, Parks Canada and the CAC will co-host the first annual Nunavut Avalanche Awareness Days in the communities of Pond Inlet, Pangnirtung, and Iqaluit. By using a nationally established awareness program we hope to initiate a larger education program that will combine traditional and modern avalanche expertise to develop training and education programs relevant to Nunavut residents.

Nunavut at a Glance

Nunavut is Canada's newest and largest territory. Established in 1999, it covers more than 1.9 million square kilometres. Despite its size, Nunavut is home to slightly more than 30,000 people. Over 85% of the population is Inuit and the median age is just 22 years. There are 26 communities ranging in size from 25 to 6,000 people, all set in a diverse landscape—from the flat muskeg areas of the mainland Kivalliq and Kitikmeot regions, to the high peaks and glaciers found on Baffin Island in the Qikiqtaaluk region. There are four national parks in Nunavut—Auyuittuq, Sirmilik, Quttinirpaaq and Ukkusiksalik. Each of them are among the largest in Canada. Combined, they cover more than 100,000 square kilometres.

Avalanches in Nunavut

Most of Nunavut's avalanche terrain is in the Qikiqtaaluk region. On Baffin and Ellesmere Islands, several communities are situated in very mountainous terrain, making on-land winter travel subject to avalanche hazard. The national parks of Auyuittuq, Sirmilik, and Quttinirpaaq are in this region and are mountainous and heavily glaciated. Although the average winter precipitation is relatively low, high winds transport almost all of this snow to terrain features resulting in large cornices, heavily loaded slopes, and bombproof wind slab. Avalanche activity occurs throughout the winter (October to March), but the majority of large avalanches occur in the spring (April-June) when snow loads are greatest and melting triggers avalanches.

Local people travel primarily on the sea ice throughout the winter and spring, although land travel is also common from the end of January to the end of May. While sea ice routes may at times be exposed to avalanche hazard from adjacent peaks, greater avalanche hazard usually exists on land routes that follow mountain passes and valleys. Visitors to national parks frequently travel in avalanche terrain, especially in the spring when ski touring puts them in high-risk areas. The terrain, isolation, changing conditions, demographics, and types of visitors all create challenges in providing avalanche awareness and education programs in Nunavut.

Risk on the Rise

Inuit and their predecessors, the Thule, Dorset and Pre-Dorset peoples have been living and travelling in avalanche terrain throughout Canada's Arctic for five thousand years. In the past, Inuit would have travelled between communities and hunting areas by dog team, and more recently by snowmobile. Hunting and travelling on the land would have been a daily activity, frequently putting travellers in avalanche terrain. For millennia these experiences developed into a body of traditional knowledge on how to recognize avalanche terrain, how to travel in avalanche terrain, and what to do in avalanche situations; knowledge that was passed from generation to generation through an oral tradition and in daily practical experience.

In modern Nunavut, hunting remains an important activity; however, the number of full-time hunters has decreased as the wage-based economy replaces traditional life. Increasingly, young hunters travel only on weekends and may not have as many opportunities to be out on the land with older, more

experienced hunters. These changes create a knowledge gap in which young people have fewer opportunities to learn avalanche awareness and safety from elders even as avalanche risk remains high.

This knowledge gap is not limited to hunters. Youth in Nunavut, like those in many southern areas, are seeking more adventurous ways to experience the outdoors. The prevalence of snowmobiles as a primary source of transportation (for up to nine months of the year) has made "adventure snowmobiling" an increasingly popular activity in northern communities. The popularity of high-powered snowmobiles in the north makes previously inaccessible terrain open to travel along with the increased risk of avalanche incidents. Several communities in Nunavut have experienced avalanche fatalities or near misses associated with snowmobile travel in the past 10 years.

In addition to avalanche incidents involving snowmobiles, there have been several incidents involving children being trapped in avalanches while playing or sledding in areas within or adjacent to local communities. Strong winds and abundant snow available for transport leads to heavily wind-loaded slopes in small ravines and other terrain features—areas that also happen to be favoured play spots for young children. In Pond Inlet in 2001, a young child was killed in an avalanche while playing on a slope that was less than 30 metres in elevation and close to town. As with hunters, for many youth the opportunities to interact and learn land safety skills from elders has been replaced by formal school-based education.

Exploring Avenues for Education

Parks Canada and the CAC are exploring ways to increase avalanche awareness across Canada's North because of the growing risk of avalanche incidents throughout Nunavut and the steadily increasing knowledge-gap between elders and youth. In addition to the proposed Nunavut Avalanche Awareness Days, we are investigating ways to incorporate avalanche awareness into school curriculum, youth programs, and community training, as well as adapting avalanche education resources to a northern context.

Andrew Maher currently lives in Pond Inlet, Nunavut, where he works as the Senior Park Warden for Sirmilik National Park and the Public Safety Coordinator for the Nunavut Field Unit of Parks Canada. Drawing on previous arctic and mountain experiences, Andrew is always seeking ways to increase public safety awareness through integration with local knowledge and youth education. When not working, Andrew enjoys exploring northern Baffin Island on skis, by kayak, and with his dog team.

Andrew Maher collection

What's New Online

By Cam Campbell

Lately there has been much effort directed at updating the CAA and CAC online resources. We introduced the new online incident reporting system in a previous issue of *avalanche.ca*. We can now report its overwhelming success. Several avalanche incidents and notable avalanches have already been reported with this system. The reports not only help to build the avalanche incident database, but the system also allows the CAC forecasters to broadcast these incidents to the public in a timely manner by linking reports to bulletins and discussion forums.

I've spent some time updating the Knowledge Centre. There you will now find an updated ADFAR 2 page and an updated Avalanche Incidents page with Avalanche Accidents in Canada – Volume 4 online, among other things. But most of my focus has been directed at the Research and Articles page, now dubbed the Digital Library. I've added more material, updated links and structured it somewhat, with the ultimate goal of becoming the best single links index in the avalanche world. As soon as I learn the ins and outs of SQL databases it will have functions such as keyword, author and subject searching for articles.

As far as I know, the current website could be described as an old and tired work horse that can barely do what we're asking of it. An entirely new website is in the plans for next year that will be a cross between a race horse and a nimble show pony. This will enable us incorporate things such as interactive Google Earth maps for incident information and discussion forums. Now if only someone would take care of the bloody drop-down menu that blocks the members' logon field and won't disappear if you click away!

Job Sharing

A new initiative between the CAC and Parks Canada aims to expand skill sets

By Doreen McGillis

www.peakalpine.com

A new agreement between Parks Canada and the Canadian Avalanche Centre (CAC) will enhance the skills of staff from both organizations. Starting December 10, 2007, and running for a period of four months, participating staff will work a number of scheduled days at each other's work place. The goal of the Parks Canada's participants is to develop and maintain forecasting skills and capacity within the workforce.

This year's participants, Wardens Pete Smillie and Sylvia Forest, will be performing the duties of forecaster. They will provide avalanche forecasting support to the Senior Forecaster and prepare avalanche bulletins for public distribution through the CAC's website and other venues.

On the days that they work for Parks Canada, CAC staff members will be assigned to snow profile field studies in Mount Revelstoke and Glacier National Park with park wardens. Parks Canada staff assigned to travel with them will learn from the CAC's staff expertise in snowpack evaluation and the CAC will be able to increase the number of field observations.

"Staff in this new exchange program will participate in a great on-the-job training opportunity that will benefit both organizations," stated Ian Brown, Parks Canada's Manager of Resource Conservation in Mount Revelstoke and Glacier National Parks. "I hope to see this relationship continue to grow and build on this success."

"This opportunity provides our CAC staff with hands-on experience in the field, not usually part of their daily duties," added John Kelly, Operations Manager of the CAC.

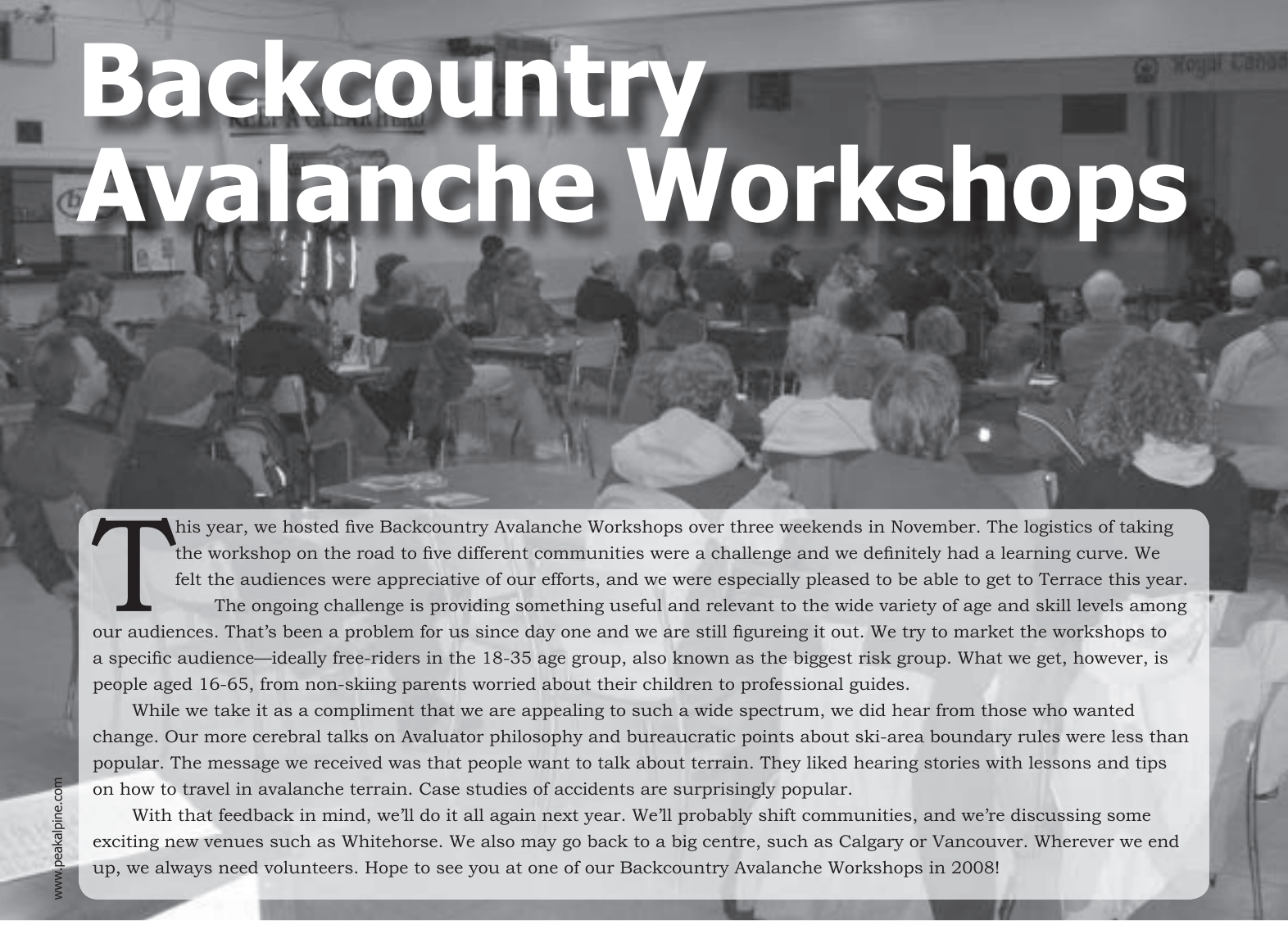
The CAC is a non-government, not-for-profit corporation established in 2004 to serve as Canada's national public avalanche safety organization. Its mandate includes the provision of public avalanche safety warnings, which is done by their team of Public Avalanche Forecasters.

Wardens from Parks Canada work with this organization's Avalanche Control Section to gather data for their daily avalanche bulletins and investigating causes of avalanches. The wardens are responsible for responding to avalanche incidents.

This staff exchange is part of an integrated approach to delivering safety information and services that is important to many organizations in the community. With this, they hope to reduce the need for response to avalanche and snow-related accidents.

>> Doreen McGillis is the Community Relations Officer for Mount Revelstoke and Glacier National Parks

Backcountry Avalanche Workshops



This year, we hosted five Backcountry Avalanche Workshops over three weekends in November. The logistics of taking the workshop on the road to five different communities were a challenge and we definitely had a learning curve. We felt the audiences were appreciative of our efforts, and we were especially pleased to be able to get to Terrace this year.

The ongoing challenge is providing something useful and relevant to the wide variety of age and skill levels among our audiences. That's been a problem for us since day one and we are still figureing it out. We try to market the workshops to a specific audience—ideally free-riders in the 18-35 age group, also known as the biggest risk group. What we get, however, is people aged 16-65, from non-skiing parents worried about their children to professional guides.

While we take it as a compliment that we are appealing to such a wide spectrum, we did hear from those who wanted change. Our more cerebral talks on Avaluator philosophy and bureaucratic points about ski-area boundary rules were less than popular. The message we received was that people want to talk about terrain. They liked hearing stories with lessons and tips on how to travel in avalanche terrain. Case studies of accidents are surprisingly popular.

With that feedback in mind, we'll do it all again next year. We'll probably shift communities, and we're discussing some exciting new venues such as Whitehorse. We also may go back to a big centre, such as Calgary or Vancouver. Wherever we end up, we always need volunteers. Hope to see you at one of our Backcountry Avalanche Workshops in 2008!

www.peakalpine.com

Feedback:

While we did receive some constructive criticism, the majority of feedback was very positive. Here's a sample of what participants had to say:

Banff

"It's a good way to start thinking about trip planning and avalanche knowledge at the start of the season, and a great motivation to take more courses and get more experience."

"BAW made me aware of a lot of techniques that were new to me—I learned a bunch."

Terrace

"Positive experience and information that will improve our chance for a safe trip into and return from the backcountry."

"As someone fairly new to backcountry skiing, I felt I was given some new and valuable information. Thank you! I hope you'll be back to do it again."

Fernie

"So informative that I plan to attend the two-day basic course. Thank you."

Squamish

"A valuable introduction to backcountry avalanche awareness."

Revelstoke

"A great way to get my head back in the game at the beginning of the season."


Kokanee
GLACIER BEER
Kokanee
GLACIER BEER
BC'S
GLACIER
FRESH
TASTE

18 Holes for Avalanche Safety

A Golf Tournament Raises Money for The Hugh & Helen Hincks Memorial Fund, and Supports a New Website for Avalanche Education

By Morgan Hincks

Hugh and Helen Hincks, along with close friend Linda Putnam, were tragically killed as the result of an avalanche accident during a ski vacation in St. Anton, Austria, in January 2005. Hugh and Helen are survived by their three children: Morgan, Teddy and Daniel Hincks. The Hincks family wanted to honour their parents' love for winter mountain activities by setting up the memorial fund through the Canadian Avalanche Foundation. The goal of the fund is to aid research and education initiatives that decrease the probability of such tragedies occurring in the future.

Hincks collection

Since the Hugh and Helen Hincks fund was established in 2005, the response has been overwhelming. After successful events held in 2005 and 2006, the third Annual HLH Memorial Golf day was held on Friday, September 14, 2007 at the Greywolf Golf Course in Panorama, BC. Many people gathered to remember the lives of Hugh, Helen and Linda. Good golf, great food and fine wine created an ideal atmosphere for celebration and generous donations.

To date, the Hugh and Helen Hincks fund has raised more than $100,000. Plans are already underway to continue the legacy of the Annual HLH event, celebrating the lives of Hugh, Helen and Linda once again in September 2008, giving everyone ample time to hone their golf skills.

The goal of the memorial fund is to inform people about the dangers of avalanches. The first project towards this goal was a joint initiative with the Canadian Avalanche Foundation to build an avalanche safety awareness website. The innovative site, called BehindTheLines.com, is designed to target youth, providing educational insight into the world of big line snow sports. The site will show how professional skiers and boarders manage the risks associated with uncontrolled terrain. Content will include professional video, interviews with well-known athletes, practical safety tips, animated short safety messages, as well as an amateur video sharing application. Look for this site to be released in 2008!

Morgan Hincks at the 3rd Annual HLH Memorial Golf Day in Panorama, BC.

Morgan Hincks

The creation of this new website is the first project towards the goal of providing a fresh approach to avalanche safety awareness. Ultimately, the hope is that by providing information about avalanches through visual and web-based media, the important message of risk mitigation will reach those that are most likely to take risks in the mountains.

For more information about the Hugh & Helen Hincks Memorial Fund, please visit www.avalanchefoundation.ca.

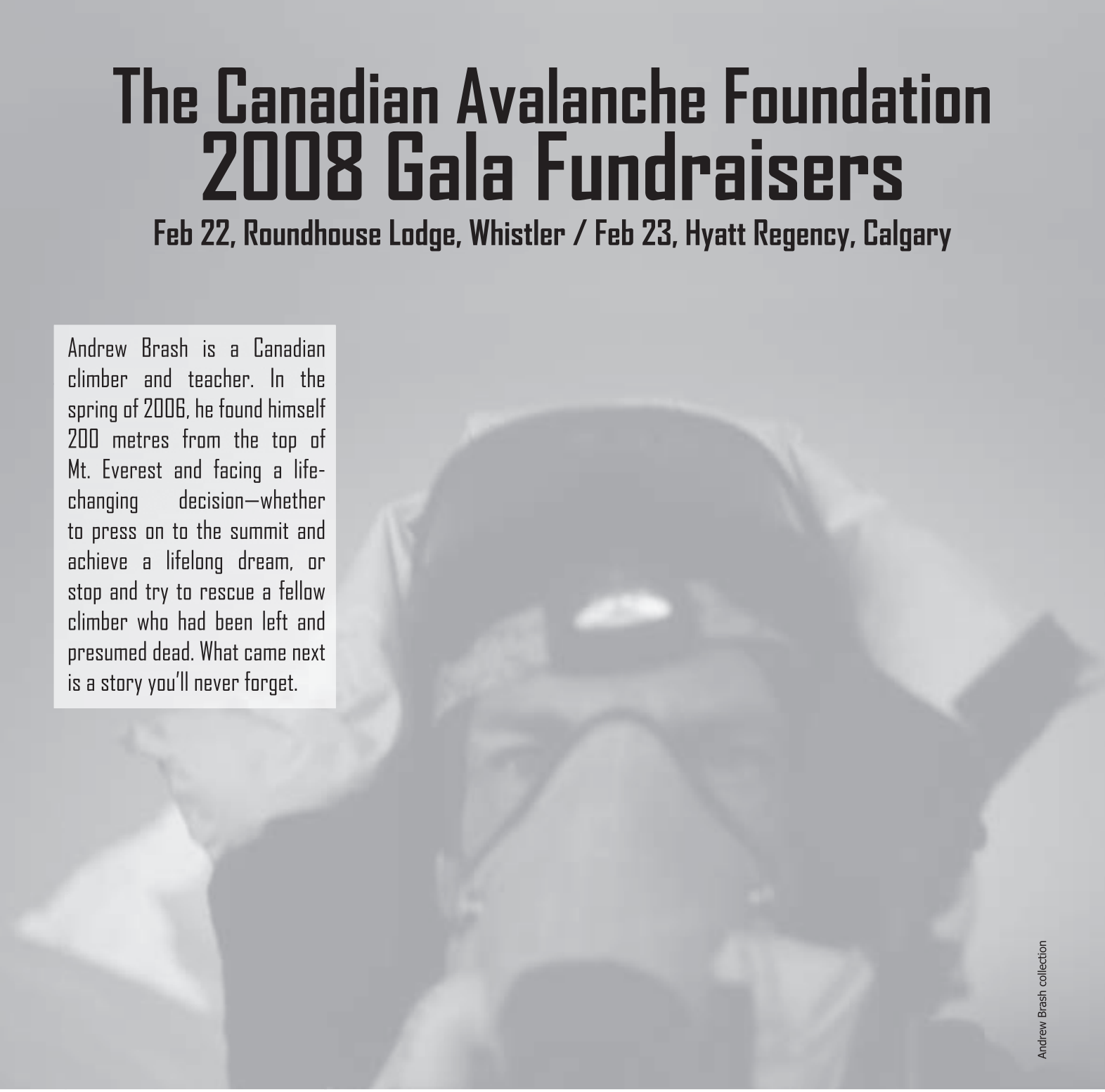
Website Input Wanted

The CAF is preparing to launch **BehindTheLines.com**, and we'd love your input and that of your teens. To access the test site, please contact the CAF at (403) 678-1235 or e-mail us at info@avalanchefoundation.ca.

The Canadian Avalanche Foundation
2008 Gala Fundraisers

Feb 22, Roundhouse Lodge, Whistler / Feb 23, Hyatt Regency, Calgary

Andrew Brash is a Canadian climber and teacher. In the spring of 2006, he found himself 200 metres from the top of Mt. Everest and facing a life-changing decision—whether to press on to the summit and achieve a lifelong dream, or stop and try to rescue a fellow climber who had been left and presumed dead. What came next is a story you'll never forget.



Andrew Brash collection

Keynote speaker Andrew Brash presents "Rescue on Everest"

Tickets are $175 each or a table of 10 may be purchased for $1500. A $90 tax receipt will be issued for each ticket purchase or a $650 tax receipt for each table of 10 purchase. Please contact our office at (403) 678-1235 or via e-mail at info@avalanchefoundation.ca for further information. We hope to see you in Whistler or Calgary this February.

The Canadian Avalanche Foundation invites you to consider making a silent auction donation to this year's fundraising galas. Last year, the CAF raised over $65,000 through the two silent auctions in Calgary and Whistler, where everything from original art to heli-ski trips went to the highest bidder. Since its inception the CAF has provided close to a half a million dollars to support public avalanche bulletins and other safety programs delivered by the Canadian Avalanche Centre across Canada. Your help is vital in continuing this level of support.

Auction #
(CAF Use)

CANADIAN AVALANCHE FOUNDATION
FONDATION CANADIENNE DES AVALANCHES

DONOR REGISTRATION FORM

Canadian Avalanche Foundation Fundraising Galas
Friday, February 22nd, 2008, Roundhouse Lodge on Whistler Mountain
Saturday, February 23rd, 2008, Hyatt Regency Calgary
Co-hosted by Chris Stethem & Justin Trudeau

Donor Name (Individual): _____

Donor Company Name: _____

Donor Address: _____

City: _____ Province: _____

Postal Code: _____ Phone: _____

Email: _____ Fax: _____

Website: _____

Donated Item Description: _____

_____

Note on Tax Receipting: The CAF is able to issue tax receipts for any in-hand donated items based on the fair market value of the item. Proof of item value must accompany all requests for tax receipting. We are unable to issue tax receipts for donated service items.

□ Yes, please send a tax receipt for my donated item if applicable in the name of _____.

□ No, I do not require a tax receipt for my donation.

Send donated item, registration form & proof of item value (if tax receipt requested, see Note on Tax Receipting above) to Sharon Audely at 137 – 4370 Lorimer Road, Whistler, BC V0N 1B4. (604) 905-2827. Email: sharon@wrec.com by February 15, 2008 or Joy & Murray McNeil, 44 Oakmount Court SW, Calgary, AB T2V 5B9 (403) 238-2935. Email: Mmcneil@shaw.ca by February 15, 2008.

Date Item Received: (to be completed by CAF only): _____ Initial _____

409 – 8th Avenue Canmore Alberta T1W 2E6 (403) 678-1235
Email: info@avalanchefoundation.ca www.AvalancheFoundation.ca
Federal Charitable Tax Number 86900 0349 RR0001

Rocky Mountain Sherpas

A fracture line in the Kashmir region of India. The Sherpas are using this shot in their promotional materials for the educational video.

The Sherpas' Progress

An update from the Rocky Mountain Sherpas, filmmakers and fun hogs working on an avalanche education DVD this winter

By Malcolm Sangster

As bits and pieces of vital film and snow-riding equipment slowly start showing up at our home office door, we try to balance our excitement with responsibility. The youthful ski bum in us is dying to get out and field test the equipment, while the maturing filmmaker is telling us to sit in front of the computer to write scripts, schedule, and find more sponsorship in order to be fully prepared for this venture.

Regardless, the Rocky Mountain Sherpas are stoked. The undying support of the Canadian Avalanche Foundation (CAF) has opened so many doors, introduced fantastic contacts, and has allowed us to get out there and do what we love to do: film the mountains and their human interaction.

Currently, we have begun production using time-lapse and macro photography in the Kananaskis Country, Lake Louise and Nelson areas. With repeat visits and thousands of frames we aim to capture the seasonal metamorphose—bare slopes turning white, cornices forming, debris piles growing, creeks and lakes freezing, flowers growing and summer returning.

"…downtown corporate meetings seem more intimidating than a 50-degree couloir with mandatory airs."

In December, 16mm film and High Definition digital shoots will accompany the time-lapses. Secret backcountry locations will be used for some unique ski and snowboard cinematography, and professional sledders will be filmed doing what they do best—getting rowdy. Helicopters will be deployed to capture ice climbers from a birds-eye view and, with the help of Canadian Mountain Holidays, we hope to get a window of clear weather and snow instability to capture unique angles on some magnificent avalanches.

While the film team has had a few days out on the slopes of Lake Louise and at Rogers Pass, we are juggling our time with Calgary teachers' avalanche workshops and downtown corporate meetings, the latter of which seems more intimidating than a 50-degree couloir with mandatory airs. The goal of getting our film package into high school and junior high curriculum looks to be very attainable and we are ecstatic about the community support and excitement about the project.

This could never be done without the generous help of the CAF and other private donations. However, the Sherpas always need more support to carry loads to the next col. Please don't hesitate to contact us if you have any questions about the project or wish to support us by any means. In the meantime, let's go shred about it—safely!

Schedule of Coming Events

January 11-13, 2008
Avalanche Awareness Days
The CAC's annual event continues the tradition! This year, our national media event will be held on Jan 11 at Sunshine Village in Banff National Park. On the weekend of Jan 12-13, some 30 communities and ski areas across Western Canada and the US will take part by hosting their own Avalanche Awareness Days. Remember, there's always room for more volunteers!
Where: Sunshine Village Ski & Snowboard Resort, and at a ski or sledding area near you.
Info: www.avalanche.ca
Contact: Call Karen Dubé (250) 837-2435 or e-mail kdube@avalanche.ca

February 22 & 23, 2008
CAF Annual Fundraising Dinner
Once again the Canadian Avalanche Foundation has organized two terrific benefit dinners to raise funds for public avalanche safety—one in Whistler and one in Calgary. Both events will be co-hosted by CAF Director Justin Trudeau and CAF President Chris Stethem. Keynote speaker is climber and teacher Andrew Brash, who will be presenting "Rescue on Everest."
Where: Feb. 22, Roundhouse Lodge, Whistler / Feb. 23, Hyatt Regency, Calgary
Info: www.avalanchefoundation.ca
Contact: Call the CAF at (403) 678-1235 or e-mail: info@avalanchefoundation.ca

April 13-18, 2008
European Geosciences Union, General Assembly
There will be two sessions on snow avalanches: Snow Cover Processes and Avalanche Formation, and Avalanche Dynamics and Risk Assessment. Deadline for abstract submission is January 14, 2008.
Where: Vienna, Austria
Info: http://meetings.copernicus.org/egu2008/

April 15-17, 2008
Western Snow Conference 2008
The Western Snow Conference provides a forum for individuals and organizations to share scientific, management, and socio-political information on snow and runoff from any viewpoint and to advance the snow and hydrologic sciences.
Where: Hood River, Oregon
Info: www.westernsnowconference.org

April 28-May 1, 2008
Canada West Ski Areas Association Spring Conference
Where: The Grand Okanagan Lakefront Conference Centre, Kelowna BC
Info: Call (250) 542-9021 or e-mail office@cwsaa.org

May 4, 2008
HeliCat Canada Annual General Meeting
Where: The Ramada Inn, Penticton, BC
Info: Call (250) 542-9021 or e-mail info@helicatcanada.com

May 5-9, 2008
CAA & CAC Annual General Meetings
Mark your calendar! You won't want to miss any of the presentations, meetings or discussions at this year's AGM.
Where: The Ramada Inn, Penticton, BC
Contact: Call Ian Tomm at (250) 837-2435 or e-mail itomm@avalanche.ca

Lyle Grisedale

Lynn traded Montreal's disco scene for Banff's bar scene in the early 1980s, and after 15 years of serving tables and ski/snowboard retail work, she started writing about mountain life. Based in Canmore, she edits the *Alpine Club of Canada Gazette*, and when she's not at her desk writing for newspapers and outdoor magazines, she's in the mountains, doing - er - research.

Lynn Martel collection

Expedition to the Edge of Unknown

This pair of articles is an excerpt from the book *Expedition to the Edge of Unknown and other stories of worldwide adventure*, a collection of articles written by Lynn Martel, to be published by Rocky Mountain Books in fall 2008.

Through the winters of 1996 to 1998, I wrote a twice-monthly column about snowboarding for the *Banff Crag & Canyon*, which I called *The Blind Side*. Still a young and often misunderstood sport at that time, my columns spoke of the lifestyle priorities of young snowboarders, and of the passion that drove the sport—then and now. Eight winters after writing the column below, while attending an information evening at the Banff Centre organized by the Canadian Avalanche Centre, I met a young man who was working to produce an avalanche education DVD. I decided to interview him to learn more about his project, and in the process learned more than I had anticipated. That article follows this column.

The Blind Side
Safety on loaded slopes
December, 1997

For the three winters that I've been writing this column, it has crossed my mind more than once that I might write about unprepared young boarders being buried by an avalanche. I sometimes feared it might be someone I knew and cared about. As it happens, I didn't know the four young people from Calgary who died in an avalanche just outside of the Fortress Mountain ski area boundary on November 29, 1997. But that makes no difference to the parents, brothers, sisters, friends and classmates who did know and love them.

The most disappointing thing about the accident that claimed their lives is how preventable it was. Every newspaper article was full of comments about how smart the four of them were—how they all were great students and friends who loved the mountains; how they were full of enthusiasm for life and adventure and powder. Yet they ventured onto a snowy mountain slope without taking one single precaution to ensure their own safety. They carried no avalanche transceivers, no shovels, no probes; they travelled in close succession ensuring that they would all be trapped together in case of an avalanche. This also precluded any possibility of one rescuing another.

For the past two or three winters all the major snowboarding magazines have gone out of their way to inform their young and adventurous readers about lifesaving precautions necessary for those riding in avalanche prone terrain. Many snowboard videos too, make a point of informing their audience

that playing in the backcountry is a risky game that requires a whole lot of respect, learning and safeguards for those who want to be around to play again another day.

The facts are simple. It doesn't take a lot of snow to produce an avalanche capable of burying and suffocating a person or fatally breaking a body apart. Nobody should be fooled by our meagre snowfall so far this season—the danger still exists. Wind can transport snow into just the kind of gully that looks like it will give you the best turns of your life. Those turns could just as easily be your last.

The backcountry is every slope that is not regularly maintained by ski hill avalanche forecasters, whether you are five minutes or five hours from the area boundary. Just because you rode a particular slope last season, last week or even yesterday doesn't guarantee whether or not it may be safe to ride today.

Any snowboarder or skier who values their own life and the lives of the buddies they ride with should be taking the responsibility to become informed, through avalanche awareness courses such as those offered by the Alpine Club of Canada, through books such as Tony Daffern's *Avalanche Safety for Skiers and Climbers* and the practice of never travelling in the backcountry without safety gear and the knowledge of how to use it.

I like to believe that we are all here to learn in this life, from our own experiences and others'. Those four youths from Calgary had their learning cut short but their experience can be a gift to others willing to accept it. For anyone planning to scoop some freshies in the backcountry, remember that patience is a virtue and tomorrow is another day (you hope). Take a minute to think about your family and friends and your powder partners and do your homework before you dive in.

Filmmaker shares avalanche lessons learned

January, 2006

As high school students in 1996, Dave Mossop and his buddies loved to duck under the Lake Louise ski hill boundary ropes to score some fresh powder lines on untracked backcountry slopes such as Burnt Trees and Pipestone Bowl. They didn't wear avalanche transceivers, didn't carry shovels or probes, didn't check on the current avalanche conditions and had no idea they were risking their lives every time they set out.

"We learned we could go duck the rope and ski Pipestone and walk out," Mossop said. "Nobody had a clue. We were pretty oblivious to the danger. We were fools, ambitious to explore. It was pretty sketchy in retrospect."

That carefree attitude was forever changed however, when on November 29, 1997 Mossop and his riding buddies lost four of their closest friends in an avalanche at Fortress Mountain. In search of early season freshies at the not yet open ski hill, the bodies of the 17-year-olds—three boys and one girl—were found close together, buried under a metre of snow.

"The news came as an unbelievable shock," Mossop said. "It was absolutely life altering. And the amazing thing is how, from that, we formed this amazing bond of friendship that's been unbroken since. All these close friends from high school share this massive bond. We've all become part of this great labyrinth of friends."

Over time, their passion for the backcountry grew, with most following their interests deeper into the mountains and with many now working as professional ski patrollers and for backcountry lodge operators, including Banff-based Canadian Mountain Holidays helicopter skiing.

"In the end it turned out being a really positive experience," Mossop said. "We learned way more about our mountain surroundings and avalanches. It turned us into really keen backcountry skiers, and into much more educated backcountry enthusiasts."

When Mossop, 25, isn't backcountry skiing through the winter months, he pursues his passion for traditional big wall rock climbing. A tree planter for the past seven summers, after graduating with honours from high school Mossop studied film and anthropology at the University of Victoria—graduating with distinction in 2004. Now an award-winning filmmaker and published photographer in major North American ski magazines including Skier and Backcountry, Mossop's current project is very close to his heart—a comprehensive avalanche education DVD.

Designed to suit the needs of both recreational and curriculum distribution, the DVD will include an exhilarating snow riding film that mixes glorious deep powder footage with horrifying avalanche accidents in progress, followed by a series of five short training films. Covering the details, facts and practices integral to safe backcountry travel, the training films will cover much of the information learned in a beginner level avalanche course, including terrain evaluation, weather observation, understanding public avalanche bulletins, fundamentals of snowpack analysis and stability testing and emergency equipment procedures.

Shot in the spectacular backcountry of Alberta and BC mountains and employing real life stories shared by avalanche survivors, the segments will re-enact different accidents scenarios, highlighting the crucial mistakes leading up to the disaster. "The capital objective of the project is to convince the viewer to take an introductory avalanche course," said Mossop, a graduate of the Canadian Avalanche Association's Level 1 Avalanche Safety for Ski Operations course. "Our youth need this information, and they need it in a language they can understand."

The DVD project, he said, has been in his mind since 1997. "It was a dream ever since our friends died," Mossop said. "We've always been aware. Ever since our friends died avalanches have been a big part of our lives. It's influenced my direction."

Along with friends including Eric Crosland, owner and founder of Rocky Mountain Sherpa productions, Mossop has

been making films since 2001. The Sherpas made their first backcountry skiing film, *Deep Seeded Instability*, in 2003, inspired by an avalanche that claimed the lives of seven Calgary teenagers in the popular Rogers Pass area in BC's Glacier National Park.

Skiing in Rogers Pass the very same day as those teens, Mossop and his friends encountered the group of Strathcona Tweedsmuir students at the Connaught Creek trailhead as they tested their transceivers, stepped into their ski bindings and hoisted their backpacks. They chatted with the teens, wished them a great day and began climbing up toward their own destination. Some time later, Mossop and his friends noticed a giant snow cloud about three kilometres away, and realized it was rising from the area the students were likely to be.

"It was a moment of panic, we wondered if we could help," Mossop said.

He and his friends quickly surmised they were too far away to help save any lives. Later that day they learned what had happened. "That was a pretty wild experience— again," Mossop said.

Motivated by the awareness that those teens contributed to a total of 29 avalanche deaths in Alberta and BC over the 2002/03 winter, *Deep Seeded Instability* is a thought provoking montage of sensuous powder riding and stomach flipping avalanche footage that captures the beauty and the lurking danger of winter backcountry travel, connected with a message of safety, awareness and education.

Accepted as a Banff Mountain Film Festival finalist and world tour entry in 2003, it also won Best Film and Best Editing at the 2004 Fernie Mountain Film Festival. Two more Rocky Mountain Sherpas' films toured with the 2004 and 2005 festivals as well.

Although the Sherpas have befitted from some funding from Backcountry Access safety gear manufacturer, Sunshine Village and Biglines.com, Mossop admits more help would be appreciated.

"We're trying to spread awareness and save lives, to share with people both the joys of being in the backcountry and the dangers you need to be aware of to negotiate a great day safely," Mossop said. "Backcountry skiing can be the richest, most happy, powerful, joyful elating activity. At the same time, it can be so terrifying and so dark."

The avalanche deaths of close friends changed Dave Mossop's life. Now a filmaker, he is working to build avalanche awareness among young people.

Rocky Mountain Sherpas

Volunteer Heroes

By Graham Knox

The British Columbia Search and Rescue Association (BCSARA) represents the interests of ground and inland water search and rescue groups and their members across the province of BC. This province currently has 93 active, sanctioned SAR groups handling approximately 1000 incidents annually. The cost to replace the volunteer resources of the province's SAR groups in direct salary dollars alone would exceed $5,000,000 annually, and that is excluding the infrastructure and capital costs which are estimated at more than $50 million.

The BCSARA officially came into being in April 2007, when the transition from its predecessor organization, the Provincial Search and Rescue Advisory Committee, was completed. The Provincial SAR Advisory Committee was originally developed by the BC Provincial Emergency Program (PEP) to provide a forum for the provincial government, the recognized SAR groups in the province, the tasking agencies for SAR services (RCMP, local police, BC Ambulance Service) and a number of other key stakeholders to address matters related to the provision of ground and inland SAR in the province.

One of the limitations of the SAR Advisory Committee was that, as a creation of the provincial government, it was deemed ineligible for a variety of provincial and federal grants available to SAR groups. In order to overcome this limitation, stakeholders agreed to establish the BCSARA as a registered society. The BCSARA continues to carry out all the functions of the former SAR Advisory Committee but with the ability to apply for various sources of funding and accept private and public donations on behalf of the recognized SAR groups in the province.

Funding for the BCSARA comes from a variety of sources. The PEP and RCMP provide funds for operation and training that is primarily delivered through the SAR academy at the Justice Institute of British Columbia. We have been successful in applying for annual grants from the BC Gaming Branch, furthering our ability to deliver training and services to SAR groups in the province. Future fundraising work will be targeted to both private donations and business support. We are also actively working with the other SAR tasking agencies and local and regional governments to provide funding to the association, or directly to the SAR groups in their region, on an equitable basis around the province.

The major focus of the BCSARA is to enhance the provision of search and rescue services in the province by accessing funding for training, providing occupational health and safety support, educating the general public on outdoor safety and acting as a common link to information and resources for search and rescue volunteers across BC. We also work jointly with PEP and others on a wide variety of issues related to ground and inland SAR.

> **"95% of subjects were found or rescued within the first 24 hours of a volunteer SAR group being activated"**

Recognized SAR groups in the province participate in a range of emergency response activities including wilderness and urban SAR, rope rescue, swift water rescue, avalanche and ice rescue, structural collapse rescue and road rescue. In 2006/2007, SAR volunteers in BC responded to 989 incidents involving 1360 missing (lost) or injured persons. Twenty-five hundred unpaid volunteers donated more than 100,000 hours of their time on callouts, and an astounding 95% of subjects were found or rescued within the first 24 hours of a volunteer SAR group being activated. In this same period, SAR groups in the province also performed a variety of other emergency response tasks for events such as flooding, wildfires and more.

The BCSARA is now at an exciting and challenging stage in its development. We are actively working to develop a strategic plan and a vision to guide the association into the future. As a young organization, we are working hard to develop the appropriate mechanisms and governance structure that will enable us to meet the expectations of members and stakeholders. The association will continue to build on the dedication and professionalism of its membership to remain an innovator at the forefront of SAR provision in Canada and the world.

The ongoing challenge for the BCSARA is to continue to deliver value to our membership and stakeholders. Fortunately, with some 4700 members, we have a wealth of talent to call upon. We are actively building a committee structure that will further engage and tap into the extensive array of talents, knowledge and experience our membership possesses.

The association has already had some great successes in its short existence, creating a peer-delivered Critical Incident Stress program and co-hosting the national conference, SARSCENE 2007 in Victoria, BC with PEP. We were able to support more than 150 of our members to participate in this internationally recognized conference, providing them the opportunity to meet and share with other SAR members from BC, as well as learning from national and international experts in ground, air and marine SAR.

The next step for the BCSARA is to move to democratically elected executive and regional directors. Elections will take place in early 2008 and will provide, for the first time ever, the opportunity for SAR groups in the province to select their own representatives. The elected members, along with other agency-appointed directors, will then turn their attention back to the critical business of the association—serving the citizens of BC and saving lives.

>> Graham Knox is the Manager of Environmental Emergencies for the BC Ministry of Environment and the Vice-President of the BC Search and Rescue Association.

Smart Bombs

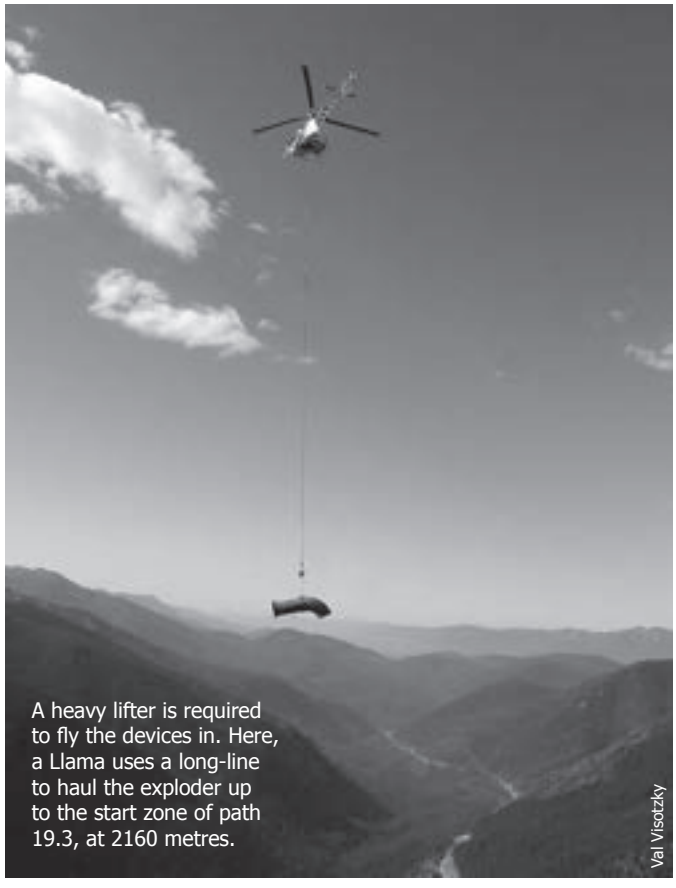
A short history of the Gazex avalanche control system at Kootenay Pass

By John Tweedy

In December 1992, the avalanche management program at Kootenay Pass suffered a "near miss" when a private passenger vehicle was hit by a size 3 avalanche after a day of vigorous active avalanche control. While there were only minor injuries to the occupants of the vehicle, the Ministry of Transportation got the message that our methods of avalanche control needed to be revamped. As a result of this incident, the ministry reviewed all the options available to deliver a more reliable method of avalanche control to protect the highway corridor.

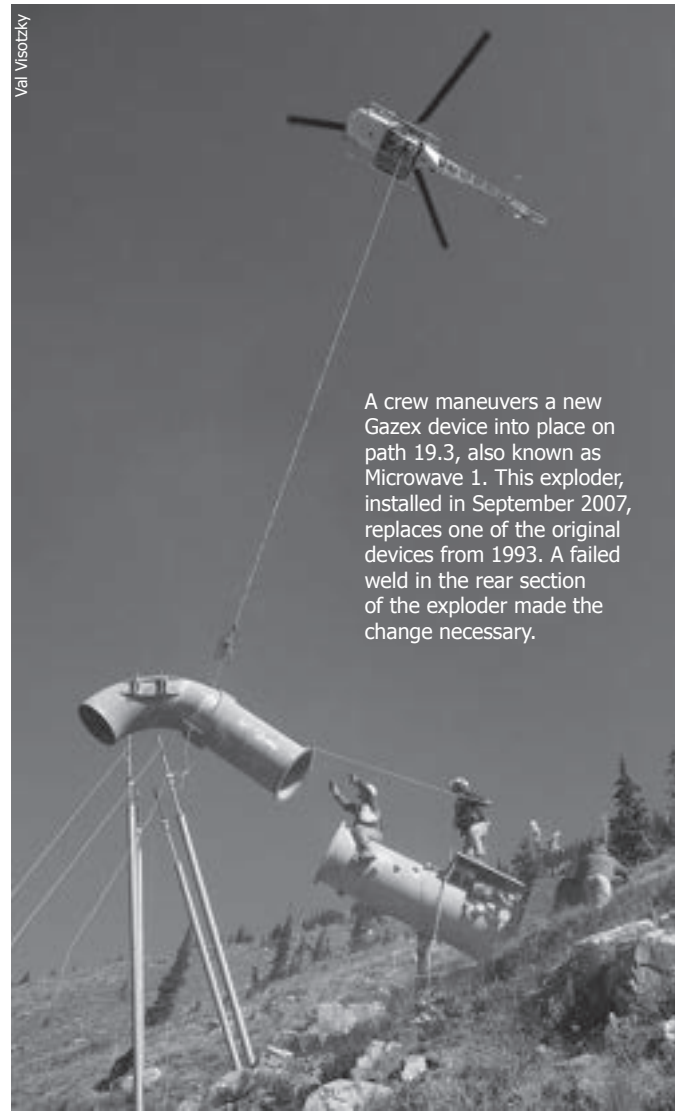
Up to this point, the Avalauncher was the primary tool used in this theater of the "snow war" waged annually in western Canada. The Avalauncher was effective, but slow. Clearing all the high-frequency avalanche paths of the pass could take as long as eight hours.

In 1993, two 105mm recoilless rifles and three Gazex exploders were installed in Kootenay Pass. With these new tools, shoot times were reduced to four hours, a significant reduction. However, there were concerns with the 105mm rifles. First, the continuing availability of the specialized ammunition it required was in doubt. As well, we could see the ordnance was damaging the geological structure of one of the high frequency avalanche areas, and rock-fall-induced avalanches were being recorded. Clearly, this had to stop.



A heavy lifter is required to fly the devices in. Here, a Llama uses a long-line to haul the exploder up to the start zone of path 19.3, at 2160 metres.

Val Visotzky



Val Visotzky

A crew maneuvers a new Gazex device into place on path 19.3, also known as Microwave 1. This exploder, installed in September 2007, replaces one of the original devices from 1993. A failed weld in the rear section of the exploder made the change necessary.

A decision was made to build a business case to make Gazex the primary tool for controlling the avalanche hazard on Kootenay Pass. In the summer of 1997, nine exploders and two control shelters were installed in the North Fork avalanche area on the east side of the pass. This area contributes some 75% of the 300 avalanches Kootenay Pass experiences on average per season. The terrain above the highway is so steep that for every three events, one will affect the highway, naturally or otherwise. The east side 105mm rifle was mothballed.

In the low season of 2000, another six exploders and two shelters were installed on the west side of the pass in

the "Noname" avalanche area. The 105mm rifle that had controlled this area was turned out to pasture. During this construction project, another large exploder was added to the east side system. Kootenay Pass now had 19 exploders and five control shelters. Shoot times had all but disappeared, with the exception of one Avalauncher that was still required to control a high-frequency slope on the west side.

2004 brought one last exploder to the Noname system. This installation required a very long pipeline of 560 metres to connect the exploder to the Noname "Delta" shelter. In 2005 our last Avalauncher was retired when we installed our final exploder. This was the first "stand alone" autonomous Gazex system to be installed in North America.

Presently, the Gazex systems on Kootenay pass consist of 21 exploders of various models and six control shelters. The system is activated via computer from the avalanche office at the summit of the pass. Shoot times are now down to less than ONE HOUR for the entire pass. Most of the delays to the traveling public are now less than two hours. The shoot and avalanche cleanup is more likely to take only an hour. Full closures over two hours are becoming rarer. The Gazex system has reduced the annual closure times in Kootenay Pass by 55-60%.

Another big benefit of this system is that it can be used on a 24/7 basis. No more waiting for daylight to fire the launcher or traveling to the 105 rifle gun mounts at 2 a.m. in a snow cat. In many cases, where there have been overnight closures of two or three hours and the highway reopened before dawn, many commercial transport truckers were not even aware the highway had been closed. This is reinforced by on-site interviews with the truckers.

The Gazex system on Kootenay Pass is not only fast and effective, it also has a much lower impact on the environment. Since the avalanche control program began in 1975, nearly 20,000 Avalauncher rounds and 5000 rounds of 105mm ordnance have been fired into the avalanche starting zones. Now, with Gazex, we can say goodbye to that. The ministry is proud to be utilizing a more "green" approach to avalanche hazard mitigation, and we would encourage you to visit Kootenay Pass to view the Gazex system.

>> John Tweedy is the Lead Avalanche Forecaster for the BC Ministry of Transportation Snow Avalanche Program at Kootenay Pass.

Did you know?

Approximate number of Gazex shots in Kootenay Pass from 1993 to the end of the 06/07 season: 5000

Current cost of a Gazex shot: $165

There's No Life Like It

The Search and Rescue Technicians (SAR Techs) of 19 Wing Air Force Base in Comox, BC are ready for anything

SAR Tech Chad Hildebrandt preparing to hoist out of a crash site at approximate 1830 m (6000 ft) in mountainous terrain in the interior of BC.

Scott Elliston

A Cormorant helicopter touches down on the Tiedemann Glacier of BC's Coast Range, supporting a combined operation between American Pararescuemen and SAR Techs, training in glacier travel, crevasse rescue and ice climbing.

Scott Elliston

SAR Tech Mike Cox on spotter training from the Buffalo aircraft, somewhere over BC.

SAR Tech Ron Kuhn on a training mission for marine rescue on the Atlantic Ocean south of Newfoundland.

Scott Elliston

Bryan Ralph

Scott Elliston

A SAR Tech, loaded down with rescue equipment, parachutes onto the Tiedemann Glacier

Scott Elliston

MCpl Steve Bates, a Rigger with the 413 Squadron, caught this great image of a freefall equipment training jump over Greenwood, Nova Scotia.

Who are SAR Techs?

SAR Techs are one of the smallest trades in the Canadian Air Force. They are trained to penetrate inaccessible areas of the country and give immediate and sustained medical care to casualties. SAR Techs are part of an aircrew and operate as a two-person team. Their training involves such specialized skills as parachuting, mountain climbing, scuba diving, and rappelling/hoisting from a rotary wing aircraft. They are also trained to act as search team members/leaders in situations requiring ground search operations.

SAR Techs are well-versed in conducting operations, performing rescues, and survival in all climatic conditions, including winter. All SAR Techs are AST qualified and many have the CAA's Level 1 course.

SAR Techs are capable of accessing winter scenes by ski, snowshoe, and snowmobile, amongst other methods and performing rescues in avalanche terrain. Of course, SAR Techs can also access an avalanche scene from above, by parachute or helicopter hoisting. This aerial view gives the SAR Techs the unique ability to assess the situation and hazards, and allows them to deploy into high probability areas.

Extracted from the Justice Institute of BC SAR Tech Profile Sheet

Deploying SAR Techs

The jurisdictional mandate of SAR Techs is air and marine. Ground and inland water SAR is the legislated responsibility of the BC Ambulance Service and the RCMP. In the case of an avalanche emergency, when the specialty training and resources of SAR Techs are required, they will be activated by request of the Ambulance Service, the RCMP or Parks Canada.

Did you know?

The SARtech branch of the military is the brainchild of legendary bush pilot and WWII veteran Wop May. Back in the 1940's he envisioned a highly skilled survival and rescue specialist who could render immediate medical aid in any disaster situation. In 1944 his vision came to life, and the Canadian Forces Survival Training School (CFSTS) was born. Today that school is called the Canadian Forces School of Search and Rescue (CFSSAR) and Canada is known the world over for its SAR expertise and training.

Extracted from Canadian Forces School of Search and Rescue by Sgt Dale Robillard, which first appeared in FrontLine SAR, Vol 1, Issue 1

Whistler ISSW 2008 Update

More news from the "Greatest Snow Show on Earth"

By Helene Steiner

Should you be among the minority of people who have not been to our amazing website, then we suggest you go and check it out NOW (www.issw2008.com)! In the early days of December the last piece of the puzzle was added: online registration. Please note, this is a much preferred method of registration. We are all a bunch of volunteers and it is less work for us if you register online, rather than print the .pdf form on the website and fax or mail it in (plus it's more environmentally friendly AND costs less time and money for you).

Speaking of registration, don't miss the early bird deadline of April 30, 2008—that, too, will save you lots of beer money. Since we have secured amazing accommodations for $15 a night (thanks to Whistler/Blackcomb) there is really no reason for you to miss this meeting of "snow heads," right?

The Papers committee has been receiving submissions and their deadlines are looming. If you would like to submit a presentation or a poster, go to "Papers & Posters" for more information. Thanks to all the great industry partners who support this conference, most sponsorship spots have been taken. Please visit their booths at the trade show with an extra "Thank you" for coming through so strong. You will find their logos on the website. Speaking of trade show: quite a few booths have been booked already, but there is room for more—please tell everyone about us!

We are always looking for volunteers to join our team! If you are keen to be involved, have some great ideas or special skills, we would love to hear from you. Feel free to contact us at issw2008@avalanche.ca.

>>Helene Steiner is the co-chair of the ISSW 2008 committee.

SIGNAL STRENGTH VERSUS SIGNAL TIMING:
Overcoming "signal overlap" in multiple burial searches

Thomas S. Lund
Aerospace Engineering Sciences
The University of Colorado at Boulder

Introduction

In the past decade, great advancements have been made in the field of avalanche transceiver rescue, most notably the worldwide acceptance of digital technology. Since 1997, average rescue times have decreased dramatically, increasing the odds of survival for avalanche victims. But as avalanche beacon technology becomes increasingly sophisticated, it can become less compatible with the existing mass of beacons already in use. This is particularly the case with new digital transceivers that use signal timing analysis to "mark" victims in complex multiple burials. While this system works well under ideal conditions, it can be surprisingly unreliable when searching for certain types of transmitters, especially as the number of victims increases.

Using a combination of computer modeling and field trials, we determine that "signal overlap" is a major concern when using "marking" functions to search for as few as two beacons at a time. The problem is deeply compounded as the number of signals increases. For this reason, "marking" functions cannot replace existing methods for isolating multiple burials. "Marking" should only be used if the searcher has already mastered reliable backup techniques such as the Three Circle[i] and Micro Search Strip methods[ii,iii] that use signal strength instead of signal timing to isolate multiple burials.

This paper should be considered in the context of modern avalanche statistics. Recent reports show that complex "special case" multiple burials requiring special techniques (or technology) are extremely rare.[iv,v] The issues addressed in this paper apply only to the limited number of professionals who are qualified to use such techniques and technologies in the field. Recreationists should be taught to master basic single search techniques, efficient shoveling, and how to organize a rescue before learning specialized techniques and technologies for complex multiple burials.

Definitions

To study the issue of signal overlap, it is first important to define several concepts inherent to transceivers, which are shown in Figure 1.

Signal amplitude: The strength of a signal, measured in volts. In oscilloscope images, this is the height of the signal above ground (or zero amplitude value).

Pulse width: The "on-time" of the transmit pulse, measured in seconds or milliseconds (1/1000th of a second).

Pulse period: The overall time period between the leading edge of one pulse in a beacon's "pulse train" and the leading edge of the next pulse, also measured in seconds or milliseconds. The pulse period includes both the "on-time" (or pulse width) of a transmit signal, plus the "off-time" between that pulse and the following pulse.

Pulse rate standard: The European standard for avalanche beacons, EN 300-718, requires that all avalanche transceivers have a pulse period from 0.7 to 1.3 seconds (700 to 1,300 milliseconds). The pulse width is allowed to be from 0.07 to 0.9 seconds (70 to 900 milliseconds).

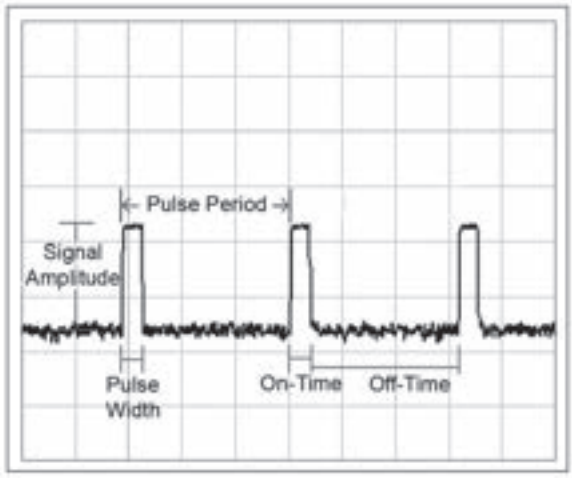


Figure 1. This transmit signal has a relatively narrow pulse width, or "on-time" relative to the overall pulse period. High amplitude makes it easy to distinguish from background noise and other transmitters.

Signal strength analysis

Traditionally, signals in multiple burials have been isolated using the process of signal strength analysis, either manually (when using analog beacons) or automatically (using most digital beacons). When performed manually, the searcher uses his or her sensitivity control to identify the closest transmitter, then locates that signal using a bracketing or induction line search technique. With most digital beacons, this is performed without the use of a sensitivity control: the microprocessor analyzes the relative amplitude of each signal and leads the searcher to the strongest signal first by only displaying the distance and direction of that signal. This is shown in Figure 2. Some transceivers can also isolate signals by identifying them based on nuances in their transmit frequency.

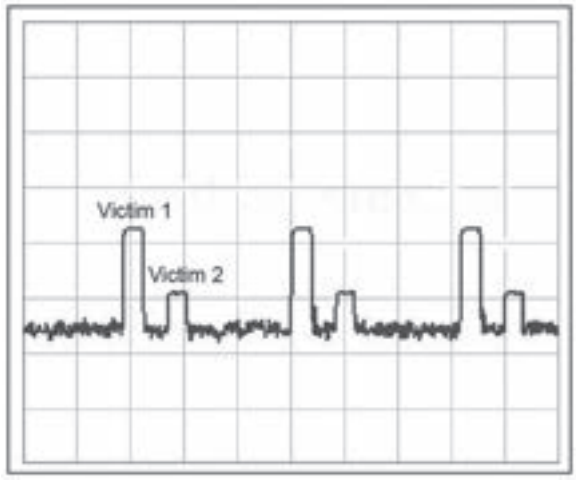


Figure 2. Signal strength analysis enables a transceiver to lead the rescuer to the strongest signal first. One signal will always have higher amplitude than another if the rescuer is moving.

Once this signal is pinpointed, the subsequent victims are located in one of several ways:

- If there are multiple searchers, each responsible for a specified search strip, then the victims are often located "in parallel" by separate searchers. In this case, no special technique is necessary.
- Most often, the first victim is excavated and their transceiver is turned off. This turns the scenario into a series of single beacon searches.
- If the first victim's transceiver can't be turned off, or there is adequate manpower to start excavating the first victim and begin searching for the next victim, then a systematic search can be performed using a variety of methods:
  - Return to the last point at which several signals were detected, and begin searching there for the next signal,
  - Return to the point at which the primary search was abandoned, and begin searching there for the next signal,
  - Or if the searcher suspects a close-proximity multiple burial–in which the victims are less than 20 meters apart–then they can perform a specialized technique such as the Three Circle Method, Micro Search Strip Method, Special Mode, or other "special case" techniques. These techniques all involve strategically moving away from the pinpointed signal until the next signal is strong enough to be re-captured and pinpointed.

Signal timing analysis

In recent years, signal timing analysis has been used to supplement or replace signal strength analysis as a method for isolating signals in multiple burials. This technique cannot be performed manually, using an analog beacon; it is only possible using certain digital beacons. In this case, the microprocessor analyzes a series of transmit pulses and establishes patterns that enable it to identify each transceiver by the timing of their pulse period (the time measured between the leading edge of one pulse and the leading edge of the next pulse). Other systems also attempt to identify each beacon based on the small differences between the various transmitter frequencies. For best results, the timing analysis integrates many pulses, not just one. The longer this sample is taken, the more accurate the timing analysis will be. However, this requires more processing time and creates "delayed display," or slow response to changes in distance and direction–even if searching for only one victim.

The benefit of signal timing analysis is that once a transmitter is clearly identified by its pulse rate, it can be "marked," or canceled after it is found. Then the searcher can move on to the next signal without performing the Three Circle Method, Micro Search Strip Method, or Special Mode. While this sounds quite simple and can work well under ideal conditions, it can break down when the victims' transmit pulses happen to be on at the same time. This is commonly referred to as the "signal overlap problem."

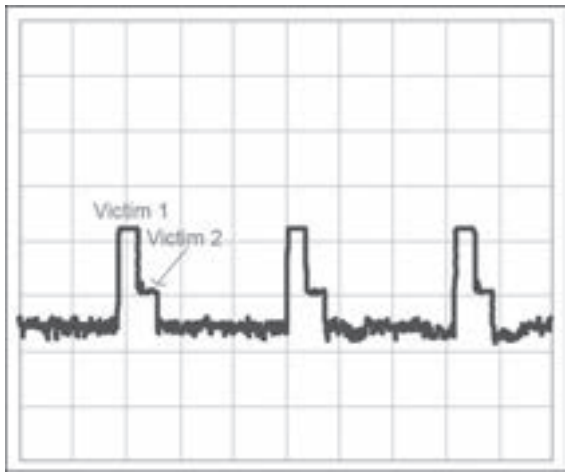


Figure 3. In this example, two signals with narrow pulse widths overlap. In the beacon's display, an icon will often disappear or a "stop" message will be shown. "Marking" now will eliminate both signals because they are no longer seen as separate victims.

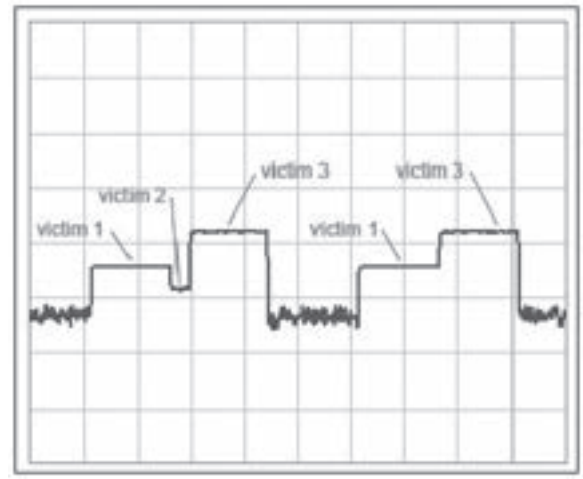


Figure 4. In this scenario, three Ortovox F1 pulses overlap. The F1's wide pulse width means the overlaps occur more often and last longer. In the second group of pulses, the signal from victim 2 has been completely concealed.

When pulses are overlapped, any number of complications may arise, including the loss of one or more signals, as shown in Figures 3 and 4. If the signals are overlapped while the searcher is "marking," then both signals may be canceled. Once the signals no longer overlap, signals that were originally masked are often shown again on the beacon display. Also, the number of victims shown on the display is often inaccurate. These issues can make a multiple-beacon search unreliable and more complicated than a traditional search using signal strength analysis. The problem can be mitigated, but not eliminated, through analysis of the transmitter carrier frequency.

Signal overlap: scope of the problem

How likely is the phenomenon of signal overlap? In the field it can be very unpredictable. It is only a matter of chance (or bad luck) that the searcher will attempt to "mark" a victim when their signal is overlapping with another transmitter. In some scenarios it is quite rare and in others it can consistently scuttle a search. This behavior stems from the fact that the probability of signal overlap varies widely, depending on the number of transmitters and on their characteristics (pulse period and pulse width).

To determine the scope of the problem, we developed a computer simulation program to predict the overlap characteristics for various combinations of transmitters. Using measured beacon properties (pulse period and pulse width) for a wide selection of beacons, the computer program could accurately simulate the simultaneous operation of two to six beacons. Since the overlap characteristics change with time–and may be dependent on the relative timing when the units were turned on–it is necessary to consider on the order of 1000^N signal pulses when a group of N beacons is analyzed. The computer simulation steps through all of these pulses, keeping track of the durations of both overlapped and clear (not overlapped) signal segments. As a consistency check, the computer simulation was validated through direct measurements of actual beacons monitored on an oscilloscope.

Results: mixed brands

In the first set of trials, overlap statistics were compiled for the 24 assorted beacons discussed by Eck et al.[vi] We considered all possible groupings of two, three and four beacons and recorded the duration of all overlapped and clear pulse segments for each. Figure 5 shows a histogram of the overlapped and clear signal durations for all possible combinations of three beacons (2024 in number). The histogram shows the probability of encountering a specified overlap (shown in red) or clear duration (shown in green). Most of the data is clustered near the center, which indicates a preference for frequent overlapped or clear pulse trains lasting only a few seconds in this case. At reduced probability, there are also a non-negligible number of cases where much longer overlaps are observed.

Of particular note is the overlap duration of 120 seconds, which shows up as a spike at the right end of the figure. This data point is actually a compilation of all overlaps lasting 120 seconds or more, as plotting all of these data at their actual overlap durations leads to an ineffective figure with a very much elongated horizontal scale. These very long overlaps occur for cases where the transmitters have nearly the same pulse period. These very long overlaps are a real concern for timing-based signal isolation strategies since it is possible to obtain misleading or null indications on the receiver display during this time.

Our field tests with real beacons confirmed that overlaps lasting at least five minutes are possible with even two beacons and that searches conducted with timing-based isolation features activated during overlap often resulted in the inability to find one or more of the victims. Furthermore, many seconds of signal processing time (during which time the display instructs the searcher to

"stand still") are often required as the beacon signals come out of overlap. Our tests also revealed that several additional minutes of time can be lost by a searcher who becomes confused by the misleading information displayed during overlap.

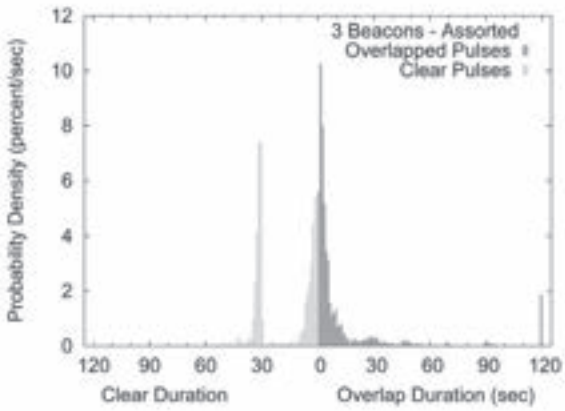


Figure 5. Histogram of overlap and clear durations for all possible combinations of three beacons taken from the study of Eck et al.

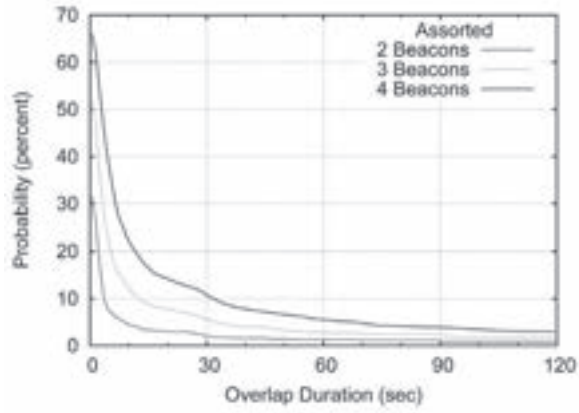


Figure 6. Probability of obtaining an overlap of specified duration for all possible combinations of two, three and four beacons taken from study of Eck et al.

Since long overlaps are of primary concern, a histogram like that shown in Figure 5 can be put in a more useful form by summing together all data with an overlap duration greater than or equal to the time in question. This gives the probability of encountering an overlap of at least the time shown on the horizontal scale. Such a plot is shown as the green curve in Figure 6, where the data of Figure 5 is replotted. In this case, the data is also included for two- and four-beacon combinations.

This figure shows that, for three-beacon combinations of assorted brands, there is a 12 per cent chance of encountering an overlap of at least 10 seconds, a 3 percent chance of an overlap greater than one minute, and a 2 percent chance of an overlap of at least two minutes. Figure 6 also shows that the likelihood of long overlaps increases with increasing number of transmitters. The probability of encountering a maximum overlap of at least one minute rises from 3 percent for two beacons to 6 percent for four beacons. It is also important to note that there is still a 1 percent chance of overlaps lasting more than two minutes for only two beacons.

Results: identical brands

The data displayed in Figures 5 and 6 is for a collection of assorted beacons that have widely varying pulse periods and pulse widths. As we shall show below, this is the most favorable situation and leads to the lowest probability of long overlaps. But what about regional preferences and guided operations that often result in an entire party using the same brand of beacon? To answer this question we chose collections of 24 Tracker DTS beacons and 24 Ortovox F1 beacons. These two beacons were selected since they are the two most common varieties found in the field worldwide. They are also interesting to study since they have rather different characteristics. The Tracker DTS is characterized by a fairly narrow pulse width (88-93 ms for the units we tested) and rather precise pulse period (784 +\- 10 ms in our study). The Ortovox F1, on the other hand, is characterized by a very long pulse width (334-401 ms for the units we tested), and a wide range in pulse periods (1210 +/- 103 ms in this case).

Probability of overlap for collections of two, three, and four Tracker DTS beacons and similar combinations of Ortovox F1 beacons are shown in Figures 7 and 8, respectively. These distributions are of particular interest since they both show a significantly greater likelihood of long overlaps. The probability of encountering an overlap lasting one minute or more is 16% in the case of four Tracker beacons and 60% in the case of four Ortovox F1's! Both beacon types are predicted to have a measurable probability of overlaps lasting at least five minutes with only two beacons. This probability rises to more than 10% in the case of four F1 beacons.

One might think that the Tracker DTS beacons should have limited maximum overlap durations since they have rather short pulse widths. The key element, however, is that they also have limited differences in pulse periods among various units. This feature results in small differences in the relative timing of pulses sent by different units from cycle to cycle and thus requires many pulses to move the signals out of overlap.

The results for the Tracker DTS beacons illustrates why it is useful to spread the pulse periods over significantly more than 10 milliseconds. A few manufacturers (including BCA) are now randomizing the pulse period in such a way that it is unlikely to obtain two or more units with very similar pulse periods.

The mechanism for long overlaps in the case of the Ortovox F1 beacons is similar to that in the case of the Tracker, with the added complication that these beacons have very long pulse widths. When three beacons with similar pulse periods are grouped together, maximum overlap durations exceeding one hour are predicted! Our laboratory tests with real beacons showed that, while drift in the pulse period would often shorten the maximum overlap duration, it was still possible for three F1 beacons

to remain overlapped for 10-15 minutes. Since these long overlaps are predicted to occur for more than 10 per cent of the time in a four-victim burial, one would want to exercise extreme caution when using ”marking” features to search for multiple victims wearing beacons with wide pulse widths.

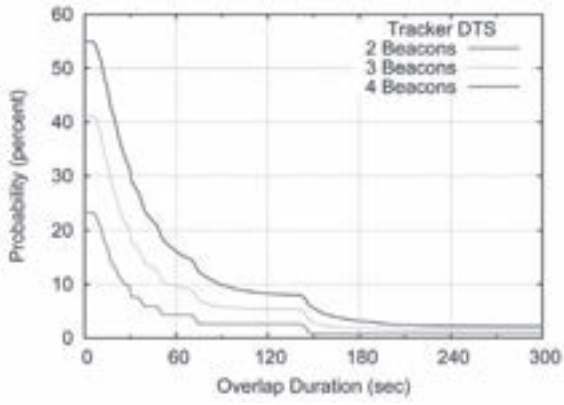


Figure 7. Probability of obtaining an overlap of specified duration for combinations of two, three and four tracker DTS beacons.

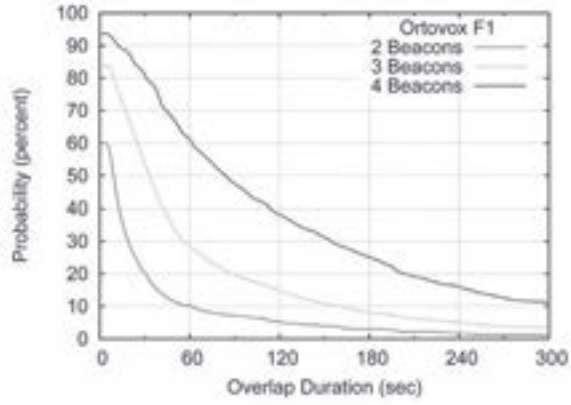


Figure 8. Probability of obtaining an overlap of specified duration for combinations of two, three and four Ortovox F1 beacons.

Reliable search techniques

Due to the potential unreliability of signal timing analysis, “marking” functions should only be used as a technique to possibly enhance a multiple burial search under ideal conditions. This is mainly limited to cases in which the transmitters are known to have pulse rates with a low probability of signal overlap—specifically transceiver fleets of mixed brands or of the same brands in which the pulse rates have been intentionally “randomized” to minimize overlap.

“Smart transmitter” technology is intended to help mitigate the signal overlap problem. However, this technology only eliminates signal overlap with two transmitters located within a radius of approximately five meters; it does not eliminate overlap with more than two transmitters or if the transmitters are further than five meters apart. Additionally, it can create other complications when searching with other “marking” beacons: the shifting pulse rate among “smart transmitters” can throw off the timing analysis of the searching beacon and often count the changed pulse rate as an additional victim.

Before using any “marking” function, all beacon users must be fully proficient in the use of signal strength to isolate signals. If this is not taught, then relying on “marking” functions alone could decrease the probability for live recovery. This is why, in their manuals, the manufacturers all suggest using a “backup” technique if more than three victims are buried. Ideally, however, the most reliable technique should be the primary technique, not the secondary, “backup” technique. Without knowing the reliable “backup” technique, users are taking risks by relying only on “marking” features.

The most widely accepted techniques for complex multiple burial searching—other than simply turning off the found transmitters—are the Three Circle and Micro Search Strip Method.[ii] The Three Circle Method was developed by the German Alpine Club[i] and is particularly suited to large deposition areas. While the Micro Search Strip Method[ii] can be quite complicated, a simplified version[iii] has been widely adopted in Canada, as it is particularly well-suited for guiding exams in which the deposition area is limited.

Multiple burials: separating myth and reality

While signal overlap is a significant issue, how common are complex “special case” multiple burials in the first place? Recent research shows that it is extremely uncommon: that less than one percent of avalanche incidents in North America and Austria involve situations where a special technique or technology might apply.[iv,v] The same studies have also documented that the most demanding and time-consuming aspect of most avalanche rescues is the excavation phase, not the beacon search. The important conclusion is that *it is much more important for educators to stress single burials and efficient shoveling than it is to focus on specialized multiple burial techniques.*

The bigger issue is “downward compatibility.” With hundreds of thousands of avalanche beacons already in use in the field worldwide, it is imperative that manufacturers design transceivers that are compatible with the existing installed base of products—including those with wide pulse widths and non-randomized pulse periods. In the absence of such downward compatibility, then a new standard should be implemented that better defines pulse rates and tolerances on carrier frequency so the newer generation of transceivers can be more reliable. This would mean, however, that transceivers not meeting this new standard would need to be declared obsolete and be retired from use.

Conclusion

While "marking" and signal timing analysis are exciting new technologies, they are not downwardly compatible with the existing base of avalanche transceivers—especially transceivers with similar pulse periods, wide pulse widths, and large deviations from the 457 kHz standard transmitter frequency. We have found that signals from even two beacons can remain overlapped for more than five minutes. For three beacons this time easily increases to 5-10 minutes. When four or more victims are buried, it is possible for the beacon signals to remain overlapped indefinitely. We also found the information displayed on the searcher's receiver was often inaccurate and confusing when the signals overlap and timing analysis features are engaged. The number of perceived victims would often change during the course of the search, sometimes showing more than the actual number. "Marking" a particular beacon once located would sometimes take a second beacon out of the search, making it impossible to find! Other times a "marked" beacon would reappear later as a target. In all cases, switching the unit to a basic signal strength mode and employing the Three Circle or Micro Search Strip Method would enable the searcher to locate all of the beacons.

"Special case" multiple burials requiring special search techniques are extremely rare, as most multiple burials can be solved as a series of single burials. Professionals teaching recreational avalanche courses should emphasize owning and using beacons, mastering single searches, organizing a rescue, and efficient shoveling technique. "Marking" should be taught only after these fundamentals are mastered, as well as existing, reliable multiple-burial technique. Searchers must then be taught how to recognize the signs of signal overlap. Likewise, rescue professionals using specialized techniques for "special case" multiple burials should not expect to rely on "marking" techniques. If these features are used, the searcher must be prepared to revert to signal strength-based techniques such as the Three Circle and Micro Search Strip methods if signal overlap is suspected to affect the search.

In the future, to better optimize "marking" technology, a new pulse rate standard may need to be adopted. Transceivers not conforming to this new standard should be retired.

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i D. Stopper and C. Semmel, *Beacon Searches with the Three-Circle Method: A baseline method for beacon searches with multiple burials*, DAV Panorama, 2004; http://www.alpenverein.de/panorama.html.

ii M. Genswein and S. Harvey, *Statistical Analysis on Multiple Burial Situations and Search Strategies for Multiple Burials*, Swiss Federal Institute for Snow and Avalanche Research; http://www.genswein.com/downloads/microsearchstrips.pdf.

iii S. Blagbrough and J. De Montigny, *Instructing Students On How ToConduct A Multiple Burial Search Using The Micro-Strip System*, ISSW Proceedings, 2006.

iv B. Edgerly and J. Mullen, *Revisiting Multiple Burial Statistics:* U.S. Avalanche Incidents 1995-2007, The Avalanche Review: Vol. 26, No. 1, p. 13.

v D. Stopper and J. Mullen, *How common are multiple burial situations? Avalanche incidents in Tyrol, Austria, 1997-2003*, The Avalanche Review, this issue.

vi M. Eck, R. Sackl, M. Schober, E. Oeljeklaus, and M. Schreilechner, *Investigation of the Interaction Between Different Avalanche Transceivers in Multiple Burials;* beaconreviews.com/transceivers/pdfs/IS-Artikel_EN_EV_19.09.2006.pdf.

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Propagation Saw Test

By Dave Gauthier and Dr. Bruce Jamieson

Introduction

In 2003 Juerg Schweizer and others posed the following important questions for future research: *How can field workers test for propagation propensity? Which properties of a slab and weak layer describe the fracture propagation propensity?*

In this article, we're reporting on three years of work at the University of Calgary (ASARC) spent trying to answer the first question: How can we test for propagation propensity in the field? One of the main objectives of this work was to develop and verify a practical testing method, one that was intuitive, easy to do, easy to interpret, and could provide practitioners with specific information about the fracture propagation propensity of any slab-weak layer combination. Photo 1 shows a case of very high propagation propensity.

Photo 1: This is a size 3.0 avalanche that we triggered from a safe place 150 m away in February 2007. Propagation propensity was clearly very high here, and we didn't need a field test to observe it!

In recent years, we've seen some exciting advances towards addressing the propagation problem in field tests. Fracture character, shear quality, and release type observations are becoming widely used and accepted additions to the standard compression test (CT) and Rutschblock test (RB) results, and have been shown to relate to propagation propensity. At the 2006 ISSW, Ron Simenhois and Karl Birkeland presented their "extended column test" (ECT) as a new method specifically designed to investigate propagation propensity in the field. They presented an amazing dataset showing that the ECT was almost perfect in predicting skier and explosive triggered slab avalanches, and the method is already widely used by the American avalanche community.

Each of these new observations and methods use some sort of surface loading or impact (taps on a shovel or a jumping skier) to *initiate* weak layer fracture, which of course leads to the *propagation* of that fracture across the test column. Our approach to the problem was to design a test method that didn't rely on fracture initiation by surface-loading. This isn't a criticism of the CT, RB, or ECT. In fact, we were mostly trying to find a way to separate fracture initiation and propagation in the test column, so that we could focus on the propagation part in our analysis.

We eventually settled on a method that uses an extended column design like the ECT, only oriented parallel to the fall-line, with the fracture initiated by gradually cutting into the weak layer with a regular snow saw. We're calling it the "propagation saw test" (PST). Aside from making the analysis simpler—in that we could easily separate initiation and propagation in the test results—this method has a further advantage over the others in some cases. With no surface loading, we can test weak layers of any depth in the snowpack (i.e. Photo 2). Where the CT, RB, and ECT are limited to weak layers down 1.0-1.2 m, we have tested weak layers with up to three metre thick slabs. The limitation was only how much digging we were willing to do!

Photo 2: The slab we tested here was over 150 cm thick, and results from testing on this flat terrain were almost perfectly reproducible on nearby slopes. The PST works with slabs of any thickness, but columns like these can take 30-45 minutes to prepare. The three metre thick ones take hours.

Before reading further, it's important to remember that we're not trying to reinvent slope scale instability assessments, or take experience and local knowledge out of avalanche forecasting and decision making. In fact, we're not even trying to replace the CT, RB, ECT, or any other method in widespread use. We're simply trying to provide one more tool to help practitioners answer a *specific*

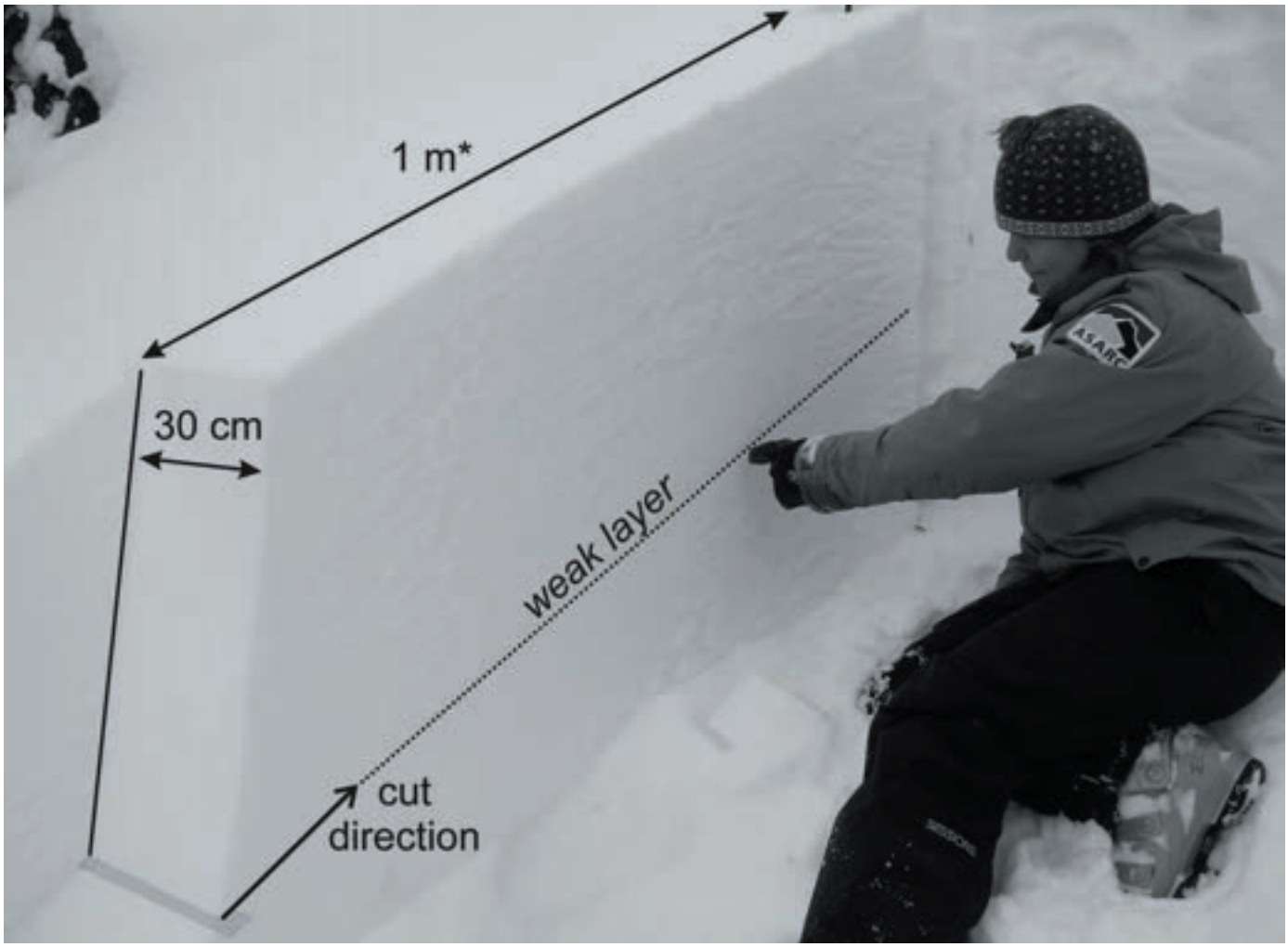

Figure 1: Photo of a propagation test column showing the dimensions and cut direction. We usually prepare the side wall and isolate the column with a rutschblock cord and two probes. Make sure the column is completely isolated from the surrounding snowpack to a depth below the weak layer of interest.

question about a *specific* part of the avalanche release problem: What will happen once a fracture is initiated in this weak layer? Will it propagate far and wide? What is the *propagation propensity* of this slab and weak layer combination?

Test Method

Terrain/Snowpack/Site Selection

Unlike almost every other instability test, the PST requires that the user choose a specific weak layer to test. Often, local knowledge, experience, or operational objectives determines the layer(s) of most interest for information about propagation propensity, especially for the deep ones. Other times, a fracture line profile, test profile or a CT or RB might identify a weak layer that warrants further investigation. As we already mentioned, there is no real limit to the slab thickness or depth of weak layer that can be tested with the PST, other than the time and effort required to excavate and prepare the test column. It can be very tricky to get a 3m tall column perfectly aligned and shaped to the correct width, and they can tip over and crush you if you aren't careful.

In developing the PST we spent a lot of time in the field doing experiments to investigate the effects of several variables on test results. In terms of terrain and site selection, we could rarely detect the effect of slope angle on test results. Where there was some slope dependence, it was minor. This means that—spatial variability notwithstanding—we could do a test on the flats at the top of a slope, and get the same results as if we did the test right on the slope. This is an advantage in many cases where you can't access the start zone safely, or don't want to dig a huge pit in the middle of a run. Other than the freedom to test any slope angle, and apply the results to adjacent slopes, we recommend the same approach to site selection that you would use for other methods.

Test Columns

Figure 1 is a photo of a fully prepared test column. Like the ECT, we use an extended column design. However, in the PST the column is 30 cm wide across-slope, and 1 m long down-slope. The column *must* be isolated completely from the surrounding snowpack, to a depth below a weak layer of interest. Note that if the slab is thicker (vertically) than 1 m, the down-slope length of

the column should be extended so that it is approximately equal to the slab thickness. A length-greater-than-height geometry is required.

We almost always used a Rutschblock cord and two probes to create the side wall and to isolate the column. It's a good idea to highlight the weak layer with a soft paintbrush or the back of a glove. This makes it much easier to follow thin weak layers with the saw, and helps identify the softest parts of thicker layers.

Test Method

Once the column is isolated, insert a standard snow-saw completely into the weak layer at the down-slope end of the column, non-serrated edge first. Next, quickly drag the saw through the weak layer towards the upslope end of the column. At some point during the cutting, weak layer fracture will start propagating rapidly ahead of the saw. Stop cutting and keep the saw in place, and try to watch the very rapidly propagating fracture. One of three things will happen:

- the fracture will run all the way up the column to the upslope end and the slab will be completely detached; or
- the fracture will propagate a short distance and stop when the slab fractures (like a crown); or
- the fracture will propagate a short distance and seem to stop for no good reason.

The important observations for interpreting the results of the test are:

1. Did you cut more than half (> 50 cm) or less than half (< 50cm) of the test column when propagation started?
2. Did the fracture propagate the whole way across the column, or did it arrest within the column?

Our verification studies, described in the next section, showed that these two pieces of information (the amount of column that was cut and whether or not the fracture crossed the entire test column) are all you need to say something about the propagation propensity of the slab-weak layer combination.

Verification Studies

Method

One of the most difficult parts of this project was trying to figure out a way to "test the test." The usual approach would be to ski-cut a slope and, based on the results, classify it as stable or unstable, and then compare the field test results with the ski-cut results. For this study, we needed to find a way to observe initiation and propagation separately, and then compare those observations to the field test results.

Of course, when a ski-cut resulted in an avalanche we could say for sure that we had fracture initiation *and* propagation. On the other hand, when the ski-cut didn't result in an avalanche, we knew that a fracture hadn't propagated, but in order to say anything about propagation propensity we needed to know whether or not we had initiated a fracture in the weak layer. If the ski-cut did fracture the weak layer, but it hadn't propagated, we could say that there is low or no propagation propensity there. However, if there was no initiation we couldn't say anything about propagation.

Our approach was to dig out the ski tracks in a few places whenever we had no result from a ski-cut, and take a good look at the weak layer to see if we could find evidence of fracture initiation around the skis. This way we had an objective observation of propagation propensity to compare with the test results. Photo 3 is an example of one case where we did find initiation, but not propagation.

Photo 3: This is an example of excavated tracks from a ski cut where the skier did initiate a weak layer fracture beneath their skis, but the fracture didn't propagate to release an avalanche. In this case the propagation propensity would be low, even though triggering was easy.

Over the course of the 2007 field

season, we made observations on 18 slopes with observed initiation *and* propagation, five with initiation but no propagation, and five with no initiation. Most of our results came from the 4 February 2007 weak layer, although we tested it in many locations around Blue River and Rogers Pass, where it was well-developed surface hoar, and around Kicking Horse Mountain Resort where it was a thin faceted layer.

Results

Propagation likely (if triggered): Our results showed that if less than half of the column was cut when propagation shot ahead of the saw, and the fracture propagated to the end of the isolated column without arrest, fractures—once initiated—were likely to propagate and cause a whumpf or avalanche. In our dataset this prediction was correct every time, provided the test column was the correct length.

Propagation unlikely (if triggered): If we had to cut more than half of the test column when propagation started, or if propagation arrested at slab fractures or for any other reason before reaching the end of the column, we found that weak layer fractures were unlikely to propagate once triggered. These predictions were correct 72% of the time in our dataset. This means that in 28% of cases where the test was predicting low or no propagation propensity, we were right next to skier-triggered avalanches or whumpfs. These "false stable" predictions are particularly dangerous, and it's very important to understand where and when they might occur.

The false stable predictions in our dataset generally occurred in thinner and softer slabs than the correct predictions. In most of these cases the compression test and Rutschblock test predicted the unstable conditions correctly. Therefore, it's very important to be cautious when interpreting the propagation saw test results in thin and soft slabs, especially soon after the weak layer is buried and the layer is just becoming active.

Comparisons

At each test site, we always did two or more compression tests and observed fracture character, usually did a Rutschblock test and observed release type, and always did a detailed profile and calculated Yellow Flags for the slab and weak layer. We then used the standard interpretation rules for predicting skier-triggering with these methods, and compared them to the predictions of the propagation saw test and our observations of initiation and propagation on the slope. We weren't trying to determine which one is the best instability test, but we were trying to understand which one was giving the best information about the propagation part.

Our results showed that the propagation saw test was just slightly better overall, but had many more false stable predictions than the other methods. However, the standard methods had many more false *unstable* predictions. The standard methods often overestimate instability, because they are testing initiation and propagation, whereas the saw test captures the propagation part better. When we analyzed only the cases of observed initiation with and without propagation, the saw test performed better than the other methods, mainly because it was much better at predicting "no propagation" than the other methods. In a nutshell we found exactly what we hoped for: the propagation saw test is not a replacement for the more traditional instability tests, but it is providing some information about the propagation part of the avalanche release process that the other methods are missing.

One further advantage worth mentioning again here is that the propagation saw test works well for weak layers buried at any depth in the snowpack. The other methods are usually limited to the top 1 m or so, where they are very accurate and where human triggering is most likely. The saw test may be most useful for following a lingering layer long after burial and determining whether or not it is a still a concern, to help answer the "What will happen if I find a thin spot and trigger this layer?" question.

Conclusions

In summary, the Propagation Saw Test (PST) seems to be able to replicate propagation behaviour likely to be found on nearby slopes. Lots of fracture propagation in the test column, without arrest or interruption, means that propagation propensity is probably high in that snowpack. The test isn't really providing any useful information about how easy or difficult it might be to initiate or trigger a weak layer fracture, but what might happen *if* it's triggered. Remember to use caution interpreting the test results in thin or soft slabs, and that this test is only a tool to help answer a very specific question about the snowpack.

We hope that many professionals will give the PST a try this winter, and we welcome any feedback or comments from anyone. For more detailed information about this project, you can download Dave's thesis from the ASARC Website (www.ucalgary.ca/asarc). Beware that reading it may result in severe boredom and drowsiness.

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Avalanche Triage

By Jeff Boyd and Ken Wylie

Avalanche accidents, although tragic, provide a profound opportunity for learning about the nature of avalanches and our avoidance and preparedness in response to them. With the clarity of hindsight we humbly study these accidents to learn what could be done better. However, some lessons learned are not about what could have been done better but rather, what was done really well.

On February 1st, 2003, 14 students and three adults from Strathcona-Tweedsmuir School were caught in a large avalanche in the Connaught Creek valley of the Selkirk Mountains. On that day all seventeen people were critically buried (head below the surface) with only a few visual clues on the surface to aid the search. Rich Marshall and Abby Watkins witnessed the accident and the pair responded immediately and decisively. Given that the two of them were responding to 17 subjects, their personal and equipment resources were completely overwhelmed. However, what is most interesting is that they maximized the number of survivors that day because they made excellent choices about how to best use these resources. They implemented triage.

Myths about Triage

As humans we have a tendency to misunderstand triage. When misunderstood it is as if the choices a responder makes are about choosing who lives and who dies. This view of triage fuels the idea that it is unethical to make a conscious choice about how to respond to an emergency and decide who to assist first. This is a myopic view of an accident response, suggesting we should assist people as we find them. But what if the first person we find will require all of our attention and take at least 45 minutes to assist them? Forty-five minutes is a lifetime for a second person with a simple airway obstruction and unable to breathe. Given what we now understand about emergencies, it is in the best interest of accident victims for the responders to use triage techniques.

Triage Defined

Triage means “to sort” and is used to establish the best order of assistance to provide the greatest good to the greatest number of people *in a situation where we have limited resources*. This statement is important because with unlimited resources we are able to provide assistance for all subjects at the same time.

In the simplest form of triage, we establish three groups to build a mental map of where to put our energy, so that it is the most effective and can have the greatest impact. The groups are categorized like this: first, the people who will survive with minimal or no help at all; second, the people who need help to survive; and third, the people who are not likely to survive even if we provide help. Using this framework we can allocate our resources effectively. It is important to pause in reflection on the third group because the time spent on them may be costly. ***If we attempt to help people who are not likely to survive we will cripple the rescue response for those who do have a chance for survival.***

Types of Avalanche Triage

In an avalanche response there are three main types of triage to consider: Burial Depth Triage, Medical Triage and, when combined together in a response, Tactical Triage (see Figure 1).

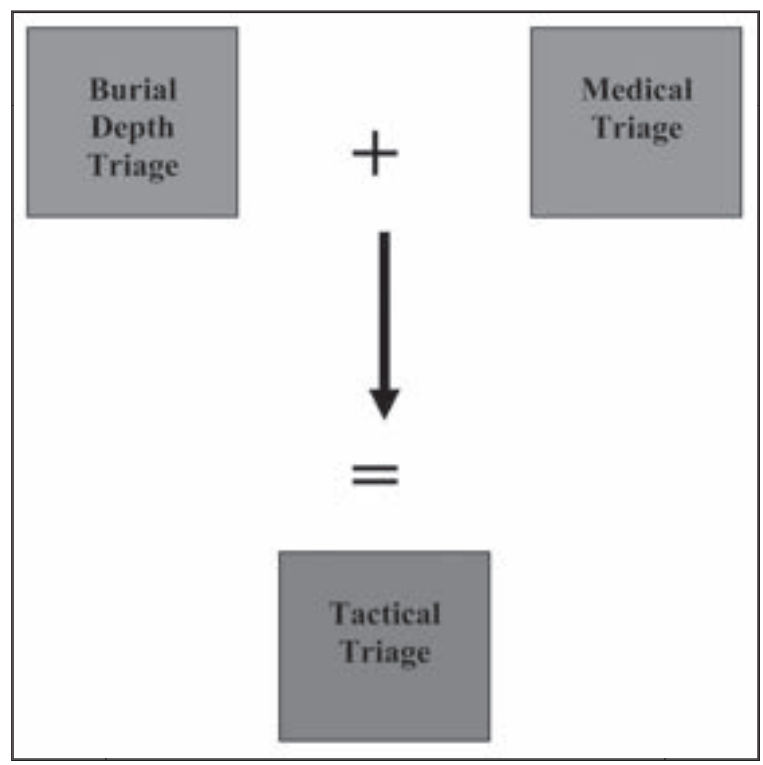


Figure 1

“Burial depth triage” is very specific to avalanche response and only relates to subjects completely buried in an avalanche. In this situation, decisions are made based on burial depth of the subject, as confirmed by a transceiver and probe. Burial depth is important because it is related to the statistical chances of survival. Survival chances decrease with depth due to the time needed for extrication and other factors like the weight of snow. In a situation where there are limited resources, time for extrication is the most important consideration. Typically it will take 20-25 minutes for a person buried 2-2.5m to

be extricated and between 9-12 minutes for a person buried a 1-1.4m deep.

Figure 2 shows the statistical chances of survival at three burial depths. If there is only a single rescuer, the burial depth of each subject should be checked before extrication begins. Regardless of which subject is pinpointed first, the shallowest subject should be extricated first (50 cm), then the mid-depth subject (1-1.4m), and last the deepest subject (2m+). When extricated in this fashion, there is a potential for the first subjects to aid in the rescue response, improving rescue resources. If the deepest subject in the example is pinpointed and extricated first there is a much greater potential that none of the subjects will survive. Burial Depth Triage is what Abby and Rich did extremely well in response to the Connaught Creek Accident.

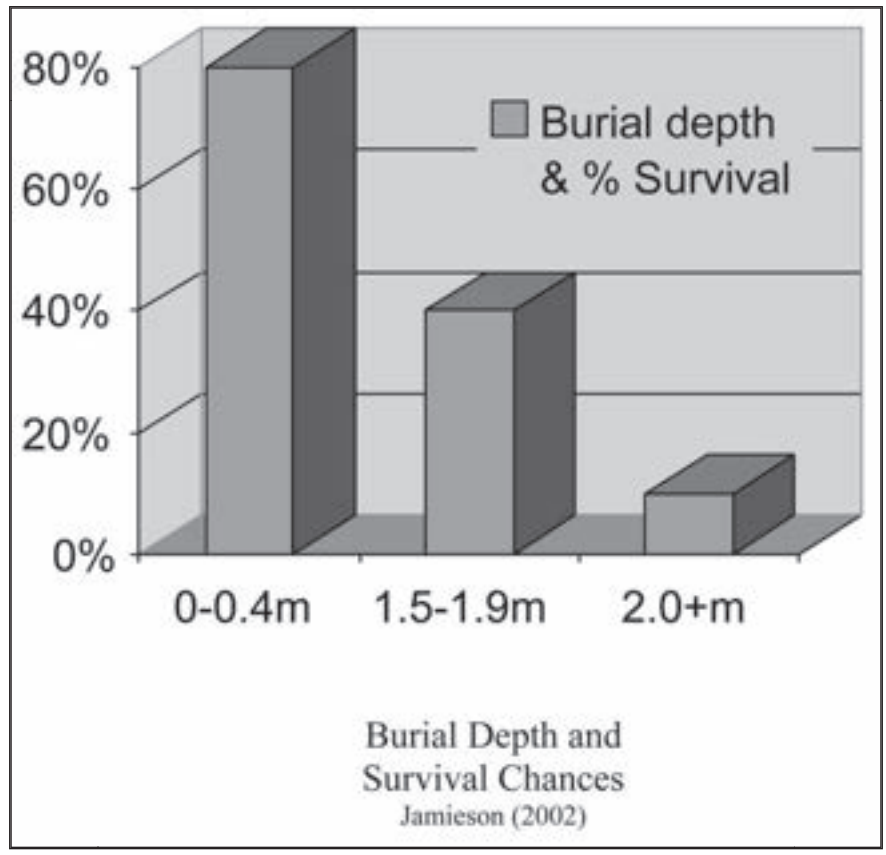


Figure 2

"Medical triage" is triage used when there are multiple injured subjects on the surface of the snow. This triage relies on a medical skill set and is not complicated by any avalanche burials. Using a colour-coding system, the severity of injury is rated, which reflects the level of urgency needed for each subject's treatment. Medical triage requires direct examination of subjects. In circumstances where there are adequate resources, treatment starts with the most critical (code red) individuals first. On the scene of an avalanche, with limited resources, that same subject may be triaged as an expectant code black under the circumstances.

Medical triage is the assessment of injuries that assists the rescuer in deciding on the allocation of resources devoted to medical treatment. The prioritization of medical care is guided by the following coding system:

Red: Critically injured. Immediate attention is needed.
Yellow: Seriously injured. Urgent treatment and monitor carefully.
Green: Patient not seriously injured. Treatment can be deferred until resources are available.
Black: Patient deceased or expectant (i.e. will die under the circumstances).

The medical management of each individual subject should follow the recommendations for on-site treatment of avalanche subjects (REC M 0013) and of hypothermia (REC M 0014) issued by the Medical Commission of the International Committee for Alpine Rescue (ICAR).

"Tactical Triage" is a combination of burial depth triage and medical triage with the addition of other factors pertinent to backcountry avalanche rescue. It is used in situations where there are both buried subjects and injured subjects. The injured subjects may be on the surface or their injuries are discovered after extrication. In tactical triage, burial depth, as described above, is one important factor to consider. Other factors are:

i) Air pocket

After 35 minutes of burial, the presence or absence of an air pocket can be an extremely valuable indicator of survivability in subjects that have no vital signs (source: ICAR Medical Commission). If a subject has been buried longer than 35 minutes, but had an air-pocket and an open airway, they may survive and resuscitation should be considered. (They should not be triaged code black unless resource limitations preclude resuscitation). If the air pocket observation was not made, the rescuers should assume an air pocket was present.

If a subject without vital signs is buried longer than 35 minutes and the absence of an air pocket is confirmed, then survival is unlikely and treatment may be ceased. If an ECG tracing is available it would show no electrical activity to confirm lethal asphyxia.

If a subject has vital signs or ECG evidence of electrical activity, then resuscitation should be considered (unless resource limitations preclude it), regardless of burial time or air pocket status.

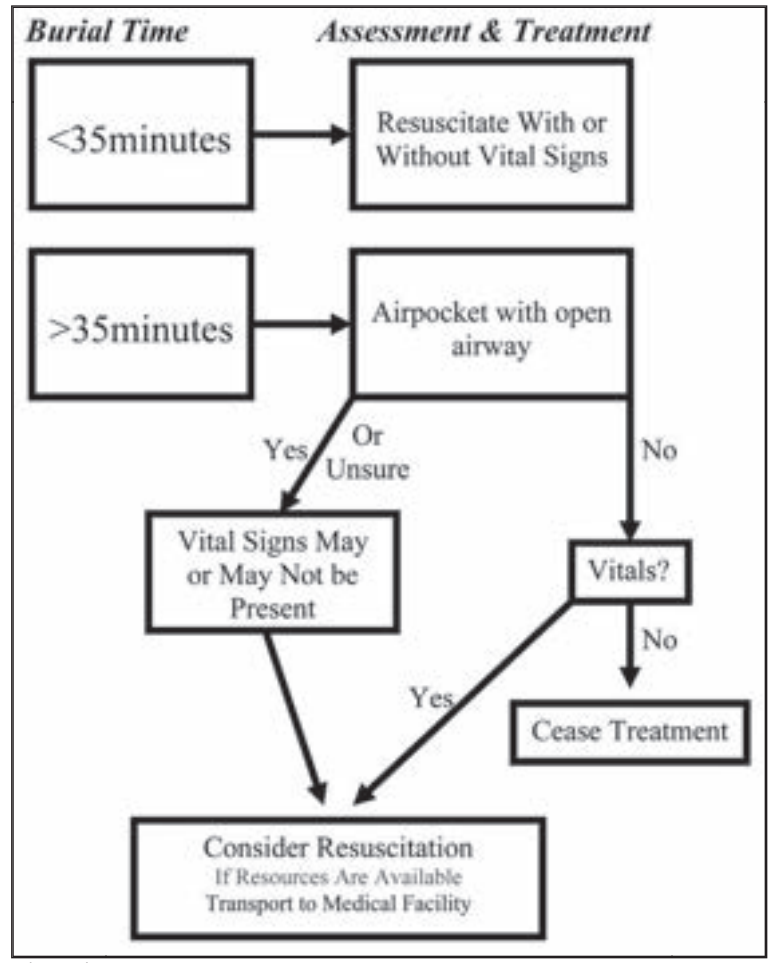
If a subject has been buried less than 35 minutes the air pocket is not an indicator. Resuscitation should be considered with or without vital signs.

ii) Medical condition

Lethal trauma such as lethal head trauma or significant body-part amputation or hypothermia with an accurate core temperature of less than 10˚ C will indicate code black. Absence of vital signs indicates lower survival than with vital signs and will be a factor to consider in tactical triage. If your transceiver has remote sensing, a positive signal indicates higher survival probability than no signal.

iii) Terrain

From a first aid perspective, reading the terrain involved in the avalanche accident is part of the knowledge needed to perform triage. Large cliffs may indicate lethal trauma, although there have been many reported cases of survival after cliff falls in avalanches. Being strained through the trees also has high potential for severe trauma. Crevasses pose a particular hazard because of the likelihood of a deep burial, and submersion (lakes, rivers) speaks for itself.



Air pocket

With all of these considerations how do we respond? The following is a system that can be used in the field during an avalanche response to attend to the many potential situations that can exist in the accident. Any system of tactical prioritization, such as the example below, may assist in multiple burial rescues when the resources of the rescue team are stressed or overwhelmed. In any other circumstance using this type of system of tactical priorities may not be appropriate.

First priority

o Immediate simple life-saving interventions for exposed subjects:

- Open airway
- Control bleeding
- Initiate self-rescue for uninjured subjects

Immediate simple life-saving measures, such as opening an airway or stopping severe external bleeding, will be a significant priority and should take very little time. These immediate life saving measures are important to underscore. An avalanche victim may be on the surface of the snow but with a bleed or a snow plug blocking their airway.

It is also important to remember that uninjured companions may become helpful rescuers if extricated. Getting these people in to service as soon as possible will increase the effectiveness of the avalanche rescue.

Second priority

- Extricate shallow burials
- Consider extricating deeper burials
- ABC's for potential survivors

There are no hard and fast rules for determining when to dig and when to move on. The important message here is to understand how burial depth affects survivability, and making the best use of your resources from there. The number of rescuers, the number of victims and the size of the search area are just three elements that will factor into this decision, and there are other circumstances that will affect the choices made by the rescuers.

Looking to the future, the eTraining project holds a lot of promise for advancements in this area. One of the goals is to map out a variety of avalanche accident scenarios with multiple burials and restricted resources. Learners will have to choose whether to dig out a victim or keep moving to locate others. As these scenarios are enacted, their results will be tabulated. Over time, the data collected will help us all to better determine the best course of action.

Third priority

- Extricate deeper burials
- Definitive medical care for survivors

Fourth priority

- Evacuate hypothermic subjects
- Evacuate other subjects
- Manage fatalities

Conclusion

It is very important to consider the use of triage in avalanche search and rescue. The elements described in this paper provide an organizational framework for understanding the potential situations a responder may face. The solutions to triage challenges are not restricted to technology. Above all, effective triage is the result of human decision making. The aim is to provide intelligent care for avalanche subjects when the avalanche responder's resources are overwhelmed. This framework has the potential of saving lives. The disclaimer is that every avalanche rescue is different and the contents of this article are guidelines only. For those individuals who think on their feet triage is a natural process in demanding situation. This was the glittering gem of beauty set in the tragedy of February 1st, 2003. The rest of us will need to carry these concepts with us in our rescue practice sessions.

This article has been written based on the knowledge collected during the establishment of best practices for avalanche search and rescue for the eTraining project. Thanks to the National Search and Rescue Secretariat for the financial support that makes this kind of material possible. It is also important to recognize the efforts of the subject matter experts who have worked on this project and have devoted a great deal of their personal time and resources to share their knowledge. Special thanks to Jeff Boyd, Manuel Genswein and John Kelly for their contributions to this article.

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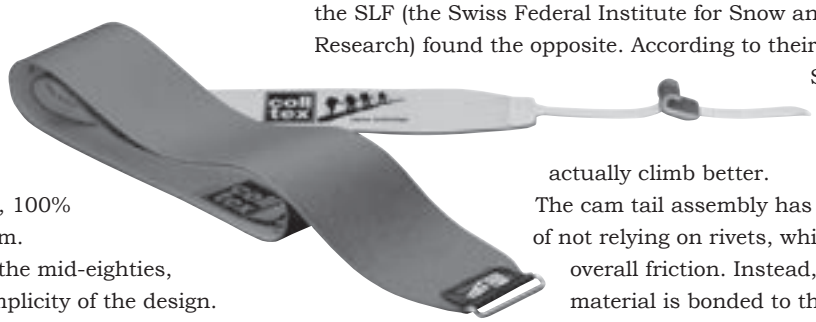
Product Review

Colltex Extreme Skins

By Sylvain Hebert

In 1968, Colltex became the first to introduce adhesive for skins. This forever changed the product as the mechanical attachment was abandoning in favour of the chemical adhesive. Colltex has used mohair ever since, a weave produced from the hair of mountain goats and laminated with a polyester reinforced cotton backing.

Colltex is now aggressively pursuing the North American market after fading from view for quite a few years. Its glue formulation (always a difficult black art to master) didn't work as well and coupled with an almost non-existent marketing strategy, the Colltex brand faded to cede its place to companies like Black Diamond and G3.



It is now back with a variety of products ranging from ultra light skins for ski mountaineering competitions to purely synthetic fabric, mixed and 100% mohair. For this review, I used the Colltex extreme, 100% mohair, with the cam lock fixing system.

When I worked at Rogers Pass in the mid-eighties, I used Colltex skins and I liked the simplicity of the design. There was a simple loop at the tip and nothing at the tail, although some came with a tail clip. With a little bit of maintenance the skins maintained their usefulness until the mohair wore out, which happened especially when used in hard conditions in the spring.

The new 100 mm Extreme skins took me about an hour to put together, assembling the wire tips and cutting the skins to size using the Colltex cutting tool. I then put them to the test in a wide range of temperatures, with my latest adventure taking me to an alpine ridge in windy and cold conditions (in the Selkirks of course). There, I had some difficulty in separating the skins, which were folded individually without the protective backing provided by the company. The fact that the skins didn't have a non-glued middle strip made it almost impossible to separate the glued sides from each other. I struggled, finding very little purchase with the small wire tip and inadvertently pulling on the cam lock tailpiece, leaving very little room on the plastic tab to readjust it again. A frustrating experience compounded by the fact that the skins didn't stick that well in the cold temperature. As we all know, most skins need to be managed in the cold, but I found that the glue didn't stick well enough for me at the –10 ˚C range and that slivers of snow eventually found their way between the skis and skins.

The skins are a bit lighter than the similar 100 mm style from Black Diamond. The glide is as good as it gets and the climbing performance was excellent. Some people think that mohair doesn't grip as well as nylon but a recent study by the SLF (the Swiss Federal Institute for Snow and Avalanche Research) found the opposite. According to their results, the SLF concluded that mohair skins actually climb better.

The cam tail assembly has the advantage of not relying on rivets, which decreases overall friction. Instead, the assembly material is bonded to the back of the skin. It seems sturdy and built to last but proved a bit too finicky for my taste. After all, competitive ski touring at Rogers Pass does not allow for any precious seconds wasted on adjusting tail clips. I still prefer the option of no attachment at the tail, or the simple stretchy plastic clip attachment that other companies provide.

To conclude, the Colltex Extreme skins are light, with a proven fabric that is easy to manage and come with the excellent reputation of an established company. The glue performs well in warmer temperatures, but its performance suffers when the conditions become harsher. The tail clip assembly did not garner extra points from this reviewer. But some of you may enjoy the reliability and sturdiness of this Swiss product. Take a look at them before you invest in a new pair, you may decide that the loop and cam lock system works well enough for you.

New for 2008 - Ct 40 glue

Through intensive research and development, Colltex has a new application process and a new adhesive for its climbing skins they're calling Ct 40. Slated for introduction at this year's trade fairs, Ct 40 is made from inorganic compounds and will be a patented material.

Colltex says Ct 40:
- is lightweight
- good for temperatures between +50C and -50C
- doesn't absorb water
- has new pressure sensitive technology (the more pressure the better it sticks)
- releases much easier off your base when you need it to
- lasts much longer than traditional glue
- less prone to contamination

The name of the glue—Ct 40—comes from the company's name and the number of years they've been making skins for backcountry skiing.

Mary Clayton

Hot Route: The Finsteraarhorn

SW face to the NW ridge
Bernese Oberland, Switzerland

By Larry Stanier

I know, this is a Canadian rag and should feature Canadian trips. But, damn, I had one of the finest days I have had on skis in years there and I am the one doing the writing.

Get yourself to Grindelwald. If you don't meet someone you know, you will probably meet Herb Bleuer's first girlfriend or someone Kobi Wyss beat up in kindergarten.

Take the Jungfraujoch railroad from Grund up and through the Eiger. Stop and ooh and aah down the North face through the gallery window. Be very careful not to be decapitated unloading your skis from the train and get out fast before you go shopping. Once you are on the Jungfraufirn there are a dozen cool things to do. I would suggest going over the Lowitor to the Konkordia Hutte for two nights. Climb the Grunegghorn or the Trugberg the next day to acclimate a bit. Then up and over the Gross Fiescherhorn (lots of crevasses) and down to the Finsteraarhorn Hutte.

Now you are in place for the business. The Finsteraarhorn is 4273 m (that's 14,015 ft for the altifooter users) and it is not going to be fun if you just got in yesterday from Vancouver. It also starts with a 1040 m ascent up 30-40-degree SW facing slopes sitting on a mix of polished bedrock down low and rolling ice up high. I believe that is avalanche terrain. The summit ridge is 185 m of fourth-class mixed climbing terrain on a very exposed ridge. The rock is good and it is very well traveled. Still, it wouldn't hurt for long if you fell off it.

So, you need to be fit, acclimated, willing and able to climb fourth-class in your ski boots, have low avalanche danger and good visibility. Good luck! Daytime warming on those big SW slopes is obviously a big deal in the spring, especially the low-elevation rock slabs. You have to get an early enough start to get up the peak and start down just when you think the skiing will be good and the danger still low.

There is a very long tradition of alpine climbing and ski

Larry Stanier

mountaineering in the Oberland. The Finsteraarhorn was first climbed in 1829 and the first winter ascent was in March 1887. This tradition includes the fabulous hut system and the early alpine start. I am a big fan of the alpine start but in mid-April of 2007, the SW faces were only beginning to soften up around 1400 hrs. Everyone had left the hut by 5 a.m. on April 17 except the lazy Canadian guide and his party who slept until 6 a.m. and left the hut around 7:30.


Larry Stanier

We put on boot crampons and loaded skis on our packs right from the start. The snow surface was knife hard and a bit rough from all the old ski tracks. That day, crampons and ski poles were way easier and faster than tacking uphill on hard, rough snow with skins and ski crampons.

You gain 575 on these big slopes to reach the "Breakfast Place." This is a bench on a rocky spur coming down directly from the summit. Walk a couple hundred metres on almost flat rocks to gain the next big slope that leads to the Hugisattel. Gaining the next slope is probably the crux of the snow slopes on the approach. As you leave the rock, the first slope you must cross is very lee, close to 40 degrees, WNW facing, with an ice cliff below. Hmm! Yes, you need to be very confident in both the snow stability and your walking ability here. If you turn around at this point you could still get a good ski run back to the hut and you should feel good about having made a very reasonable decision. I felt very confident I would need a hydrogen bomb to start an avalanche at that moment so we carried on with crampons to the Hugisattel. At this point we started to get passed by the first parties starting to ski down. We could hear them before we saw them, as their chattering skis and teeth made an impressive clatter on the frozen ruts.

At the Hugisattel, we carefully stashed the skis. There is a lot of gravity, people and wind around this spot and it would really suck to lose a ski now. This is another key decision point. Do you have the time and the abilities to deal with 185 m of fourth-class mixed terrain in your ski boots? The snow slopes below you are perhaps warming up as you climb and you have to get up and down this airy ridge. I felt we had lots of time and I was comfortable short-roping a rather busy rope of six guests up the route in the perfect conditions we had that day.

If everything is in your favor, it is a magnificent climb. We had dry solid rock, hard perfect steps on the snow/ice and a calm beautiful day. The terrain is conducive to belaying in lots of places IF you can made clever use of the rock features. From the wee pointy summit, in the hot sun, we had clear views of the whole Bernese Oberland, distant peaks such as Mt. Blanc, the Matterhorn and Monte Rosa and through a haze towards Andermatt and on to the Bernina Alps.

Climb back down the ridge, again without falling off and oh so carefully put the skis back on. You should be done with the crampons, axes and rope if all goes well.

Now, where and how do we ski down? The vast majority of parties ski down the ascent route to the hut. It is simpler and

avoids a slight climb back up to the hut at the end of the day. It does, however, mean the possibility of LOTS of old ski tracks. More importantly, it also means skiing on snow that sits over those 35-40-degree glacial-polished rock slabs just above the hut. If the snow is going to be overheated anywhere, this is the place. More stories from that place later.

I chose to ski down the glacier NW of the ascent route (see photo). This offered way better skiing and also allow us to stay off the rock slabs at least most of the way to the main Fiescherfirn glacier. Glacial recession is starkly evident in the Oberland and the ice tongue we skied down was no exception. We may have been skiing above some bare rock near the bottom of the run and it will certainly be bare rock sometime in the near future unless the warming trend really changes. (Not bloody likely!)

From the Hugisattel we skied down the glacier to approximately 3700 m. Then we traversed north about 150 m and skied fall-line to the glacier. This would be a very bad idea in poor light. There are some big crevasse bands to sneak through and perhaps some bare ice and rocks to get through down low. Having said that, it is a fantastic ski line. We had smokin' good corn all the way down, and it was almost completely free of tracks, compared to the line of ascent that had bumps in places. Cruise down the glacier and wander up to the hut's sundeck for cappuccinos or beer.

Fast forward 10 days. I am coming over the Grunhornlucke in a warm fog heading back to the Finsteraarhorn Hutte with another group of guests. It is one of those greenhouse days and we had a very poor freeze the previous night—3 C at 7 a.m. and overcast all night. Yuck!

I just don't feel good about climbing up the snow slope to the hut below the big rock slabs. You can hear water running everywhere and it is pouring from the rocks near the hut. I decide we shall hike up the Via Ferrata/trail to the hut and keep ourselves and our skis well out of harm's way. As the fog clears around the hut I am very impressed by the snotty, wet size 3 that covers the trail up the snow to the usual ski depot (see photo).

No one is running around screaming so I head up to the hut to inquire about the damage. It seems at 3 p.m. the avalanche buried and killed 10 pairs of skis and poles. Fortunately the owners of the skis and the other parties just starting up the slope were missed.

The next night was similarly warm so we passed on the Finsteraarhorn and had a fine day on the Fiescherhorn. Lots of parties did climb the Finsteraarhorn that day and skied down the 40-degree slopes running with water at 3 p.m. beside the size 3 as other parties skinned up over the debris. Ignorance is bliss until you're dead.

Finish your journey by climbing either the Wyssmollen (good) or the Gross Wannenhorn (really good) and skiing down valley and climbing to the Oberaarjoch Hutte. Start your next day there by climbing the Vord Galmihorn in the morning. In the afternoon, either ski the Oberaarrotjoch from east to west or eat the house specialty rosti and venison sausage with white wine for lunch and nap the afternoon away. You will almost die if you do all three. I certainly did. Next morning, ski out to the Grimsel Pass and shuttle back to Interlaken or Grindelwald. If you get the weather and conditions that I did you are a very lucky human indeed.

Larry Stanier

Maps

Landeskarte des Schweiz 1:25,000 #1249 Finsteraarhorn and # 1250 Ulrichen.

Guidebook

Alpine Ski Mountaineering Volume 2 Central and Eastern Alps by Bill O,Connor Cicerone press.

CAC Public Avalanche Forecaster
Anna Brown


Anna Brown collection

Born in Connecticut, brought up in Victoria, Anna Brown moved to Revelstoke five years ago. As someone who has always chased the snow, it's no surprise that she ended up here. Anna has been skiing all her life and spent many years travelling in the backcountry with her family. When she was 19 she began working on the Blackcomb Ski Patrol, one of only two women in the staff of 30 patrollers. After 10 years at Blackcomb forecasting weather, doing avalanche control and teaching avalanche courses she left to guide full-time.

In 1998 she became an ACMG assistant ski guide and spent a winter guiding in New Zealand. She has been ski guiding since then and got her ski guide certification in 2002. She has racked up a wide variety of guiding experience, from heli- and cat-skiing to ski touring and has worked for a number of backcountry operations throughout the province. She is also an avalanche instructor for the CAA's Industry Training Program.

Anna hasn't exactly been taking summers off. She finished her B.Sc in Geography from UVIC in the summer months, and worked for BC Parks as a ranger and Parks Canada as a warden. She's happy to have landed at the CAC forecasting office, and says, "The CAC is a fun workplace with great people. And I get to feed my habit of always wanting to know where the best skiing is. Truly I am really a bit of a snow geek." Anna, you're going to fit right in.


Ken Bibby collection

CAC Public Avalanche Forecaster
Ken Bibby

In addition to his duties as Director of the Membership Committee for the CAA and CAC Boards of Directors, Ken Bibby has taken on the job of a public avalanche forecaster. Ken lives in Rossland, BC, with his wife Kim Van den Erembeimt and their three young boys. Ken is a Ski Guide and this winter is his first season as Guiding Operations Manager for Big Red Cats. He also works as an independent ski touring guide at various lodges throughout BC, and is an instructor on the CAA's Industry Training Program. In addition to his guiding and avalanche training, Ken says he's also currently enrolled in the VanBibby School of Parenting.

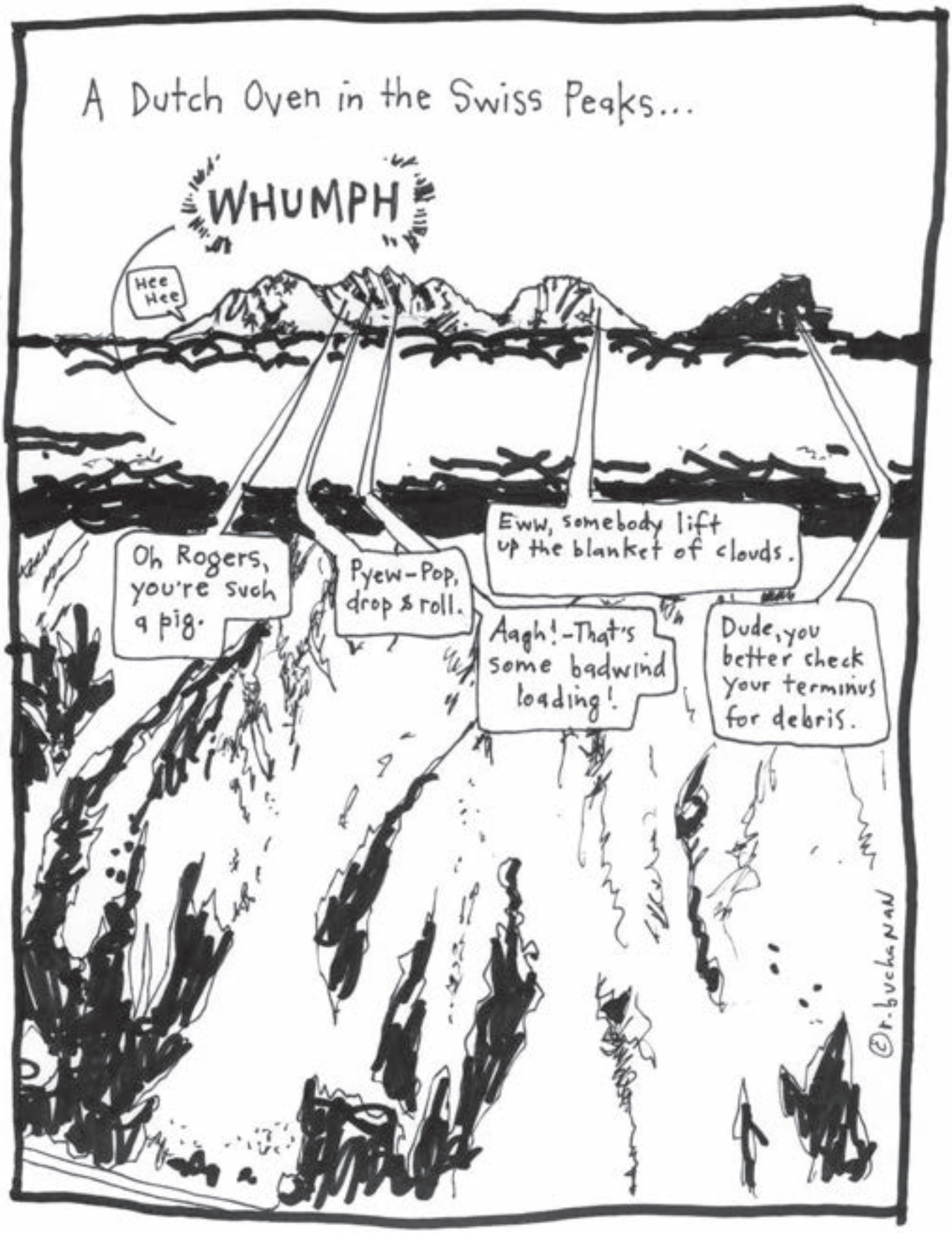
Ken is looking forward to the coming winter as a forecaster. "I find the work challenging and I'm learning lots," he says. "I enjoy the people at the centre. It's a group of talented, hard working and dynamic folks with a variety of backgrounds and experiences. This is a pivotal time at the CAA and CAC, with rapidly changing public and government expectations, and increasing demand for our programs and services. I also experience a lot of personal satisfaction in helping to provide a product that has the potential to help backcountry users make better and safer decisions in the backcountry."

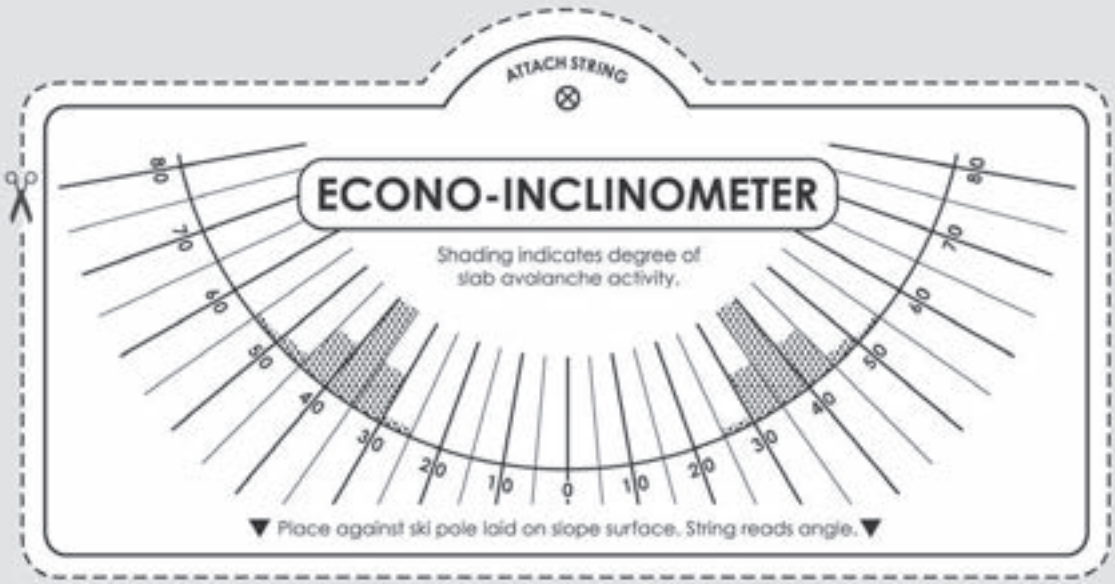
Mike Rubenstein

Congratulations to CAA Operations Assistant Mike Rubenstein and his partner Melissa Huntley on the birth of their daughter Aziza Storm. Mom and baby are both doing great and Mike adds, "Did I mention I'm in love?"

Tensile strength of snow! Photo from Kirstie Simpson in Whitehorse.

Flakes


A Dutch Oven in the Swiss Peaks...
WHUMPH
Hee Hee
Oh Rogers, you're such a pig.
Pyew-Pop, drop & roll.
Eww, somebody lift up the blanket of clouds.
Aagh! - That's some badwind loading!
Dude, you better check your terminus for debris.
©r.buchanan



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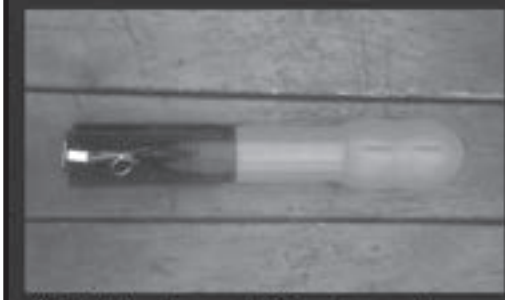

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