CANADIAN AVALANCHE ASSOCIATION

AVALANCHE NEWS

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The deadline for the next issue is October 15, 1995. Material may be sent to the Canadian Avalanche Centre. Submit typewritten hardcopy or a diskette in a major wordprocessing format (Word for Windows 6 preferred). Illustrations should be submitted as hardcopy or in electronic form (.TIF, .WMF, .CGM are preferred). In all cases, send a printed copy of your submission in addition to electronic formats. Please contact the Avalanche Centre for more information.

Snow and Avalanches 1994 - 1995

Winter arrived early on the Coast. The ski areas had the earliest openings in many years but not without a cost. On 19 November a ski patroller was killed by an avalanche in the second major snow storm of the winter. Eventually the Coast region had one of the biggest snow seasons, especially on Vancouver Island and the Central Coast. Despite the deep snowpack on the Coast it was generally a strong snowpack outside of the storm cycles and skiers reported skiing very steep slopes in locations never previously skied. In the north Coast and Skagway/ Whitehorse areas the snowpack was much below average accumulation.

In the Interior and Rocky Mountain ranges the height of snowpack values met but never exceeded the 20 year average. In the Interior ranges there were some well defined persistent instabilities that commercial operations had to work around very carefully through the darkest part of winter until nearly late-February. Some of the best skiing and snowmobiling conditions were late in the winter with cooler snowfalls on the stronger snowpack giving ideal conditions.

In the Rockies the snowpack characteristics were true to form. There are not meant to be any rules of thumb in the avalanche business but this winters snowpack in the Rockies was consistent with the 'rule'. It was weak. The usual depth hoar base was always ready to surprise the unprepared, some were very lucky at Bow Summit and some not so lucky at Burstall Pass (see avalanche involvements in this issue). The crevasses on the icefields were slow to fill in but gave good touring conditions later in the winter. The steep approach slopes to cols that link the icefield routes maintained a weak snowpack until late in the winter.

On transportation routes avalanches caused closures much less than the twenty year average. Certainly far less than those of 1971-72 which was the only winter to have more avalanche fatalities since 1965. The winter of 1971-72 is well remembered by many avalanche workers as being the deepest snowpack in Western Canada. So this winters high number of avalanche fatalities is not because of a 'big' winter. Once again it was not the fault of the snowpack and avalanches.

1994 - 1995 Avalanche Schools

The Canadian Avalanche Association Training Schools had another successful year. There were 246 students on twelve courses. The graph below shows the trend in student numbers since 1972. The growth in numbers of people doing the Level 1 continues. The numbers doing the Transportation & Industry and the Level 2 course has dropped in the past few years. This is probably because there is not as much staff turnover and many people in the industry now have the required qualifications.

At the spring meeting of the course instructors they discussed the past courses and made plans for next years program. Three of the most important issues discussed were:

1. There appears to be an increasing number of students who are doing the course for primarily recreational interests and some who come to the courses with inadequate skiing skills. More careful explanation in the brochure and a description of pre-requisites will help to resolve this problem. The course is a professional course and the high standards must be maintained.

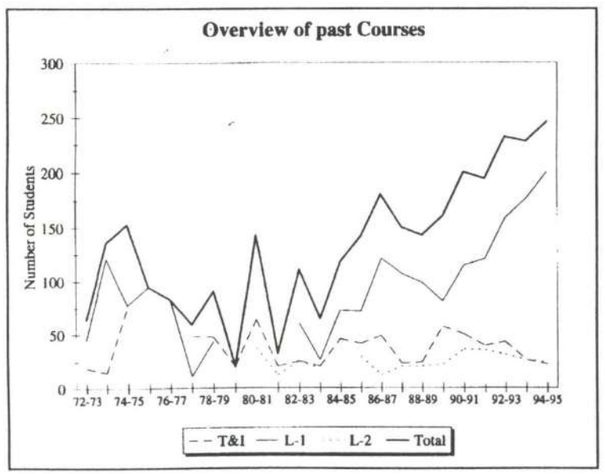
2. Janice Johnson, Jim Bay, and Peter Schaerer are working with a number of instructors on developing new course and instructor material including the manual. This will be an important contribution to maintaining the high standard of the courses. The work is partially funded by the National Search and Rescue Secretariat.

3. The Schools suffered a financial loss this year. This was the first loss since the Canadian Avalanche Centre started to run the courses. The amount of the loss was equal to the cost of instructor training and offset by the small margin of profit from last year.

The Schools continue to maintain their status as a registered school in Alberta and British Columbia. It is hoped that the provinces may license schools in more than one province if we meet the requirements in any province. It would save a lot of duplication of effort.

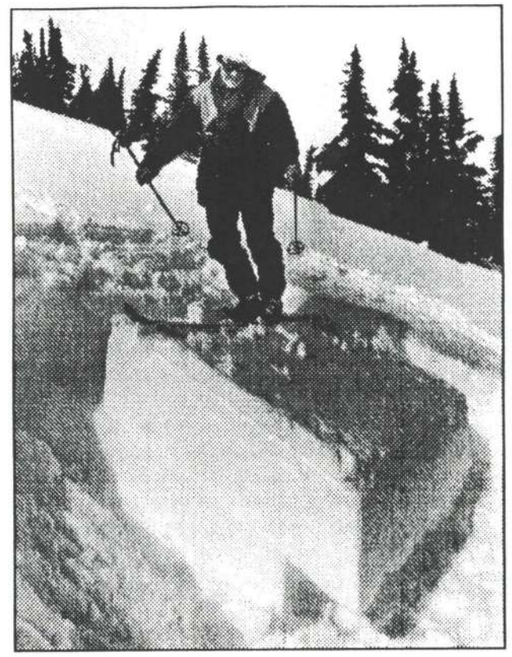
Also, prospective students should know that there have been changes to the tax deductible status of courses. It appears that courses with classroom sessions of one week or less do not qualify. This does not recognize that any student of the CAATS has to serve a formal apprenticeship to successfully complete the course. Students may wish to write to their Member of Parliament to discuss the issue.

The courses continue to be the only source of technical training for workers in Canada who play an important part in maintaining a safe and economic transportation, ski, and tourist industry.



Interpreting Rutschblocks in Avalanche Start Zones

Bruce Jamieson and Colin Johnston
Dept. of Civil Engineering, University of Calgary

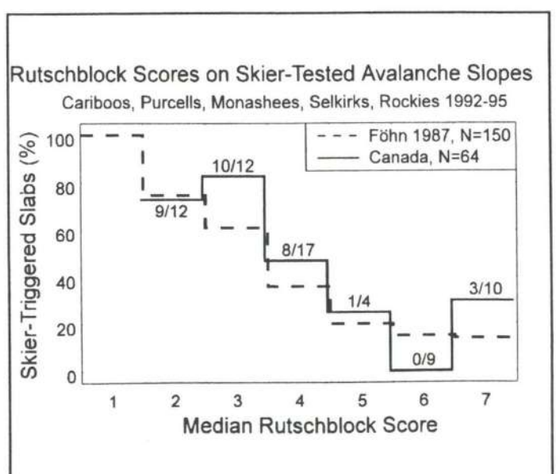


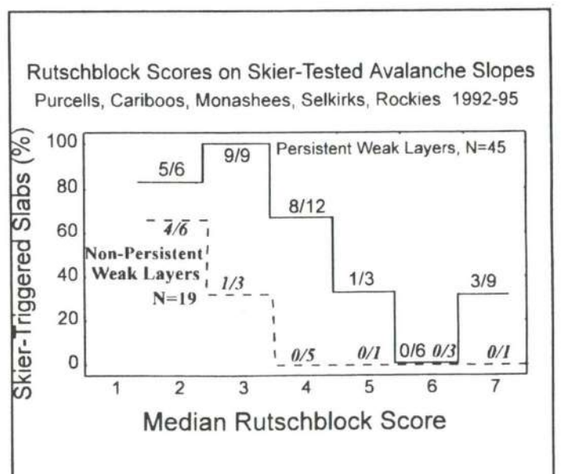
Rutschblock tests in avalanche start zones should be better indicators of slab stability than tests on nearby slopes. But just how effective are rutschblocks in start zones? Let's start with the usual interpretation: rutschblock scores of 1, 2, or 3 (blocks that slide before the first jump) indicate that the slope can probably be skier triggered; rutschblock scores of 6 or 7 (blocks that did not slide on the first or second jump) indicate that the chance of skier triggering has dropped to about 15% (Föhn 1987).

The fact that 15% of the slopes with rutschblock scores of 6 or 7 slide is important. The first and most obvious message is that we should not bet our life on the results of one or two rutschblocks– other factors must also be considered before we commit ourselves to a slope. The second and more subtle message is that picking a *representative* site for a rutschblock requires experience. Föhn attributes the fact that slides occur on slopes with rutschblock scores of 6 and 7 to the difficulty in selecting sites that are safe yet representative.

As a small part of a larger project (Jamieson and Johnston 1995), we did a field study in the Columbia and Rocky Mountains of Western Canada that was similar to Föhn's study in Switzerland. The good news is that our study showed a similar decrease in skier-triggered[1] slabs as rutschblock scores increase from 2 to 6. The bad news is that skiers did trigger 3 of the 10 slopes with rutschblock scores of 7! Two factors contribute to such *false stable* results. First, our field staff seek out unusual and unexpected avalanches for study and any unusual rutschblock results are included in the graphs. Second, for this study our field staff did the rutschblock tests where

[1] We use skier-triggered to refer to avalanches intentionally or accidentally initiated by a skier.

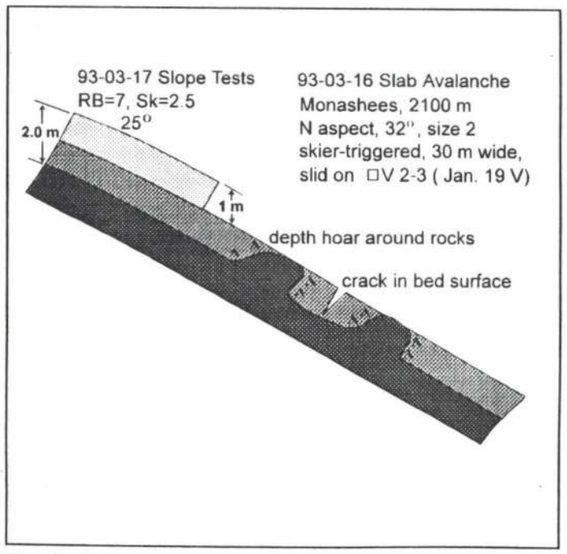




slab conditions appeared *typical of the start zone*. Unfortunately, not all slab avalanches are triggered where slab conditions are typical. Of the ten start zones with rutschblock scores of 7, skiers triggered two of them where the slab was much thinner than average, and the other was likely triggered from a small weak area near rocks. We will get back to two of these slides as case studies.

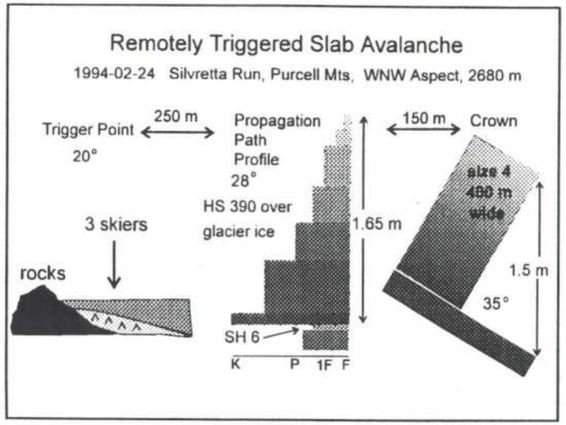
But first, let's look at the most interesting outcome from this Canadian study. We separated these 64 results into rutschblocks that slid on *persistent* weak layers (second graph, page 2) such as surface hoar and facets, and those that slid on *non-persistent* layers such as low-density layers of decomposing stellars. While there were only 19 results for non-persistent layers, the frequency of skier-triggering is clearly less than for persistent layers. Note the fit that occurs if the dashed line for non-persistent layers is shifted 2 steps to the right. For persistent layers with rutschblock scores of 4, the frequency of skier-triggering is the same as for scores of 2 on non-persistent layers. And the frequency of skier triggering for rutschblock scores of 5 and 6 is the same as for scores of 3 and 4 respectively on non-persistent layers. So, next time someone tells you they got a "rutschblock 4", ask them what it slid on! Knowing the grain type of the failure plane can make a big difference to the interpretation of the result. Of course, depth of the failure plane, as well as terrain characteristics such as slope angle, aspect, elevation, and terrain feature should also be noted (CAA 1995).

A word of caution: although skiers did not trigger any of the 10 non-persistent slabs with rutschblock scores of 4 to 7 in our study, this does not mean it cannot happen. A larger study might show some skier-triggered slabs for such rutschblock scores.



Case Study 1

On 16 March 1993, a 1 m thick slab was triggered by a skier on a 32° moraine slope in the Monashees. When we reached the site the next day, the most representative undisturbed site was on the 25° slope above the crown fracture. At this site, both the shear frame stability index (Jamieson and Johnston 1995) and the rutschblock (*RB*=7) indicated stability. At 5-6 places, rocks and humps in the moraine were exposed in the bed surface. At these places where the snowpack was only 1 m thick prior to the avalanche, depth hoar surrounded the rocks and humps. Although the exact trigger point is not known, the slab was likely triggered at one of the shallow places with depth hoar. Hence, a stability test several metres away from a localized weak spot can be misleading. Features of the terrain and ground cover that may be hidden under the snowpack sometimes play an important role in the stability of avalanche slopes.



Case Study 2

The slab avalanche on Silvretta Glacier in the Purcells on 24 February 1994 illustrates remote triggering. Three of were skiing on gentle terrain and stopped near some rocky outcrops on the east edge of the glacier. We felt the shallow snowpack collapse under our skis and heard a "whumpf". Moments later we received a radio call saying that a large avalanche was running down the west-facing slope approximately 400 m to the west.

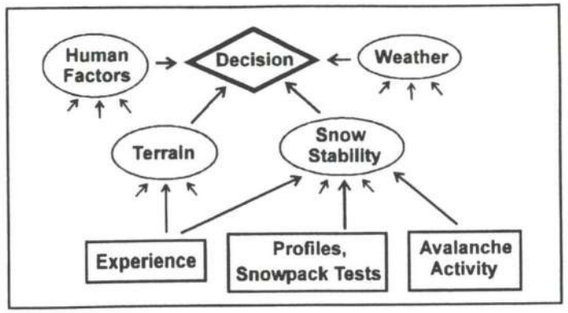
We could not get safely to the crown, so we observed a profile approximately 150 m east of the crown. The thickness of the slab at the profile site was approximately the same as the average thickness of the crown. The bottom 0.7 m of the 1.65 m slab consisted of *pencil* to *knife* hard layers. (Extensive fracture propagation is commonly associated with thick slabs containing such hard and stiff layers.) The rutschblock did not fail (*RB*=7), even when all three of us jumped without skis on the rutschblock at the same time.

We believe that the fracture started in thin weak snow near the rocks, spreading through a snowpack that could not be triggered by skiers and released a large slab avalanche when it reached a slope steep enough to slide. As with the first case study, the fracture probably started in weak snow where the snowpack was particularly shallow and associated with a terrain feature less than a few metres long.

Logan (1993) gives similar examples of triggering from local depth hoar weaknesses in the Colorado Rockies.

Local snowpack fractures occur whenever skiers break into weak snow over rocks, bushes and near ridges. However, although a weak layer and a stiff slab are required for propagation, there is presently no practical snowpack test that indicates whether these local

fractures will propagate over tens or hundreds of metres or not at all. The more extensive the propagation, the more likely the fracture will encounter a slope steep enough to slide.



The rutschblock is a practical stability test, especially when done in avalanche start zones or where conditions are similar to avalanche start zones. However, as the case studies illustrate, the rutschblock tests cannot, by themselves, indicate stability consistently. For making decisions about access to avalanche terrain, such tests can complement but do not replace experience, knowledge of terrain, other snowpack observations, and weather observations.

Summary

For slabs of less than 90 cm in thickness, rutschblock tests in avalanche start zones are useful but not a definitive indicator of slab stability for skiers.

For a given rutschblock score, slabs overlying persistent weak layers are more likely to be skier triggered than slabs overlying non-persistent weak layers.

Fractures started by skiers at localized weaknesses in the snowpack sometime spread through areas where stability tests indicate that skiers could not start fractures. If these propagating fractures encounter slopes steep enough to slide, a slab avalanche can result. There is a need for a snowpack tests that indicate whether local fractures that start near rocks, bushes, and ridges will propagate over distances large enough to release slab avalanches.

Acknowledgments

For financial support, we are grateful to Canada's Natural Sciences and Engineering Research Council (NSERC), Mike Wiegele Helicopter Skiing, Canadian Mountain Holidays, and members of the BC Helicopter and Snowcat Skiing Operators Association.

For their expertise and field work at various times during the last three winters, we are grateful to Jill Hughes, Leanne Allison, Ken Black, James Blench, Aaron Cooperman, Sue Gould, Brian Gould, Rod McGowan, those who volunteered to work in the Bobby Burns, and the staff at Yoho, Glacier, Jasper and Banff National Parks, and BC Ministry of Transportation and Highways at Kootenay Pass.

Peter Schaerer provided scientific liaison to NSERC and advice regarding study sites and field methods. Jill Hughes helped compile the data. Many thanks to everyone that supported and helped this research project.

References

Canadian Avalanche Association. 1995. Observation Guidelines and Recording Standards for Weather, Snowpack and Avalanches. Canadian Avalanche Centre, PO Box 2759, Revelstoke, BC, 95 pp.

Föhn, P.M.B. 1987. The "rutschblock" as a practical tool for slope stability evaluation. *In* Salm, B. and H. Gubler, eds. *Avalanche Formation, Movement and Effects*, International Association of Hydrological Sciences Publ. 162 (Symposium at Davos 1986), 223-228.

Jamieson, J.B. and C.D. Johnston. 1995. Monitoring a shear frame stability index and skier-triggered slab avalanches involving persistent snowpack weaknesses. Proceedings of the International Snow Science Workshop in Snowbird, Utah, (October 1994).

Logan, N. 1993. Snow temperature patterns and artificial avalanche release. In: Proceedings of the International Snow Science Workshop in Breckenridge, Colorado, (Oct. 1992), 37-46.

Avalanche Involvements in Canada: Winter 1994/95

by Torsten Geldsetzer

The biggest news this past winter was the high number of fatalities. At 16 it is the highest since the winter of 1971/72. Of the 16 fatalities, 5 were snowmobilers, 4 were skiers, 3 were climbers, 2 were hiking, and 2 were buried in their home.

We had a total of 73 total reported involvements this year - keep in mind that these are only the reported figures - there are a lot of involvements out there that we don't hear about. The 73 involvements totaled 137 people:

- 60 Backcountry skiers
- 24 Ski area skiers
- 24 Out of bounds skiers
- 3 Climbers
- 14 Snowmobilers
- 11 Others

On a regional basis there were 13 involvements on the South Coast, 21 in the Interior Mountains, 31 in the Rockies, and 7 in Central B.C..

Complete burials are the most dangerous aspect of an avalanche involvement. This past winter there were 28 people completely buried with about half of them surviving. Wearing an avalanche transceiver still proves to be the best tool for search and rescue.
Fatalities:

Mount Athabasca - August 31, 1994

Two climbers were swept over a cliff and carried 300m by an avalanche on the Silverhorn route. The slab developed from storm snow from August 26/27 and slid on well developed facets 20-40cm down. One person was partially buried and suffered a broken leg. The casualty was completely buried and although he was found quickly by following the climbing rope his injuries were too severe.

Hemlock Valley Ski Area - November 19, 1994

While inspecting a ski run during avalanche control work, the deceased was caught by a size 2 avalanche. There was an unusually deep early season snowpack. He was not wearing his transceiver and it took four hours to locate him under 1.5m of snow. He was found by random probing.

Mt. Rider - February 4, 1995

A heli skier was caught in a size 2.5 skier triggered avalanche 50km NW of McBride. He was located by transceiver and probe under 4m of snow and was dug out in 25 minutes. He was flown to the McBride hospital but was pronounced dead on arrival.

Raven Lake - February 18, 1995

Three teenagers were caught in an avalanche while hiking up and sliding down an avalanche path at Raven lake, 100km East of Prince George. None of the party were wearing or carrying any avalanche rescue equipment, nor did they have any awareness of the danger they were in. Two of the three were completely buried, the third was able to find one of the buried victims but was unable to dig him out. He went to get another member of his party who was at a hut nearby but that person was unable to locate the victims. It seems another avalanche had come down in the meantime. The two surviving members left to notify the R.C.M.P.. Due to the remote location and continuing avalanche danger, an organized rescue was not able to get into the area until 70 hours later. They were found by random probing.

Burstall Pass - February 19, 1995

A group of skiers from the Rocky Mountain Ramblers in Calgary were skiing in the Burstall Pass area of Kananaskis Country, Alberta. None of the group carried avalanche transceivers nor were they carrying probes or shovels. In addition the avalanche danger for that day was rated extreme. Two of the party were buried by a size 2 avalanche which the party had triggered from below. Another nearby party responded with probes and found one person after 20 minutes who was unconscious but recovered. The casualty was found after 40 minutes under 1.5m of snow.

Cascade - February 24, 1995

Two ice climbers died in an avalanche while on a climb called Urs Hole on the South side Cascade mountain, near Banff. The avalanche danger at the time was rated considerable overall, but due to the aspect and weather conditions the danger at the accident site was much higher. One body was retrieved from the frozen waterfall, the other has not been found yet.

Bruce Creek - February 26, 1995

A snowmobiler near Invermere was caught in a snowmobile triggered size 2.5 avalanche. The victim was not wearing a transceiver but the party were carrying probes and shovels and were able to find him in 6 minutes under 1m of snow. CPR was done for 20 minutes when the victim started breathing on his own but he remained unconscious. He was evacuated to a local hospital and then on to Calgary. He did not recover.

Kakwa Recreational Area - March 5, 1995

A snowmobiler died in an avalanche near Broadview Mountain, on the Alberta/B.C. border east of Prince George. None of the party had any avalanche rescue gear or training. The size 3 slide was snowmobile triggered and the victim was buried 2m. He was found by an avalanche dog the following day.

Blanc Sablon - March 10, 1995

Three people were buried while sleeping in their home in Blanc Sablon, Quebec, with one surviver. A freak storm loaded a 130m high embankment above their home which avalanched during the early morning hours. Fifteen other homes were evacuated due to continued danger. The survivor was found by following her voice; she was dug out from under 3m of snow after 6 hours. Her husband and son were found dead.

Jasper Park - March 15, 1995

One person was caught in a size 2 avalanche outside Marmot ski area, near Jasper. The party was unprepared and carried no transceivers, probes or shovels. The victim was found by an avalanche dog after being buried for 1.5 hours under only 20cm of snow.

Telkwa Range - March 19, 1995

A snowmobiler was killed in an avalanche in the Telkwa range, near Smithers. He was highmarking on a slope and triggered a size 3 avalanche. None of his party were aware of the avalanche danger and were not carrying any rescue equipment. An organized rescue from Smithers was initiated and his body was found by probing around his machine which remained on the surface. He was found after 4 hours under 2m of snow.

Doctor Creek - March 19, 1995

Two snowmobilers died in an avalanche West of Canal Flats, B.C.. The size 2.5 slide was snowmobile triggered. Eight people were caught in the slide, four were partially buried, and four were completely buried. Of the two casualties one was wearing a transceiver and one was not. There were also two other people with injuries. The party of 14 were parked at the bottom of an avalanche slope while one or more were on the slope highmarking.

Many of the above accidents occurred because the people involved were either unaware, uneducated, or unprepared with regard to avalanches. In fact, only two of the 16 fatalities were wearing transceivers. Had they taken the time to get educated, carried the proper safety equipment, and were informed about the danger rating many of this past winter's fatalities probably would not have happened.

Most of the people that died this winter lacked the basics. If we can say anything good about the high death toll this winter, it is that maybe the associated media coverage has reached a lot of people and made them stop and think. Maybe next winter anyone going into the backcountry will be prepared, educated and informed.

PUBLICATIONS

The International Classification for Seasonal Snow on the Ground
Issued by The International Commission on Snow and Ice of the International Association of Scientific Hydrology. This publication is available from the Canadian Avalanche Centre, Box 2759, Revelstoke, B.C. V0E 2S0, phone 604-837-2435 or fax 604-837-4624.

AINEVA NEVE E VALANGHE
Available from Aineva, Centro Nivometeorologico, della regione Lombardia, via Milano 18, 23032 BORMIO (So) Italy. Cost is L 25,000 Italian for three issues per year.
Note: This publication is not to be confused with the classic **NEVE E VALANGHE** by André Roch.

Observation Guidelines and Recording Standards for Weather, Snowpack and Avalanche Observations.
This new, completely revised document replaces 'Guidelines for Weather, Snowpack and Avalanche Observations' last published in 1989 by the NRC. Available from the Canadian Avalanche Centre. $20.00.

Canadian Ski Patrol System Avalanche Program - An Overview

Gordon Ritchie- CSPS Avalanche Coordinator Mountain Division

The CSPS formed in 1941 is a national association with 6,500 members who patrol at over 250 ski areas in Canada. The Avalanche Program began in the 1960's when Brad Geisler of the US National Ski Patrol moved to Alberta. Since that time the CSPS has been actively teaching avalanche awareness courses and promoting avalanche awareness to the public through a wide range of initiatives. Today, the CSPS Avalanche Program's primary objective is training of patrollers at over 20 CSPS ski areas with avalanche terrain. The CSPS offers a Basic Avalanche Awareness Course which is taught by instructors from within the CSPS. Instructor requirements have been formalized for theses courses. As well, an Advanced Avalanche Awareness Course taught by qualified CAA members is offered.

The second key objective of the Avalanche Program is to continue contributing to public awareness and education. The CSPS has offered a public awareness course through the Calgary Board of Education for 20 years. Other initiatives include support of seminars, publication of pamphlets and sponsoring Avalanche danger scale cards. During the 1994/95 season six courses were offered by CSPS and were held at Fernie, Fortress Mountain, Big White, Lake Louise and Marmot ski areas, and in Calgary. There were a total of 80 in attendance.

The CSPS is currently strengthening its program to train patrollers by expanding the courses it offers in BC. Comments and input from CAA members are welcome. Contact Gordon Ritchie at
(403) 286-7442 home
(403) 296-7691 work.

Canadian Avalanche Association Technical Meeting Report

May 3, 1995, Revelstoke, B.C.

Jim Bay

Chairman J. Bennetto brings the meeting to order and outlines the plan for the next two days of meetings.

UNIVERSITY OF CALGARY - RESEARCH UPDATE

B. Jamieson presented an update on his continuing research on Rutschblock and shear frame tests, particularly on persistent weak layers.

Recent research compared Rutschblock scores and actual skier triggered avalanches in the study area. The study was carried out in a number of locations throughout the Interior and Rocky Mountains.

Some important points made by Bruce were:

- For slabs of less than 0.9m in thickness, rutschblock tests are useful but not definitive indicators of slab stability for skiers.
- For a given rutschblock score and slab depth, slabs overlying persistent weak layers are more likely to be skier triggered than slabs overlying non-persistent weak layers.
- There is a need for a 'propagation index' that will assist in estimating the likelihood of extensive fracture propagation.

See the page 2 in this issue of Avalanche News for a more complete summary of this presentation.

U.B.C. RESEARCH GROUP

Dave McClung presented a summary of the research and development work that he and his students are conducting at U.B.C.

- Temperature effect on the release of dry soft slabs.
- Avalanche forecasting model 'Snow Profile Assistant' is a software package combining snow profile and analysis capabilities. This model has been used in the MOTH Kootenay Pass avalanche control program with reasonably good success.
- Risk Mapping avalanche terrain - This project analyzes avalanche terrain path by path and produces a risk factor for each path. The number is an estimation of the likelihood of the path producing an avalanche that would have destructive effects to people or property.
- Avalanche Dynamics/Runup and Runout - Dave described current calculations used to estimate avalanche runout distances (runup is the distance an avalanche can run up the slope on the other side of the valley).

ELECTRONIC BLASTING CAPS AND AVALAUNCHER DEVELOPMENTS

Garry Walton of SEAR described a new blasting cap being manufactured in South Africa which has computer set time delay feature. Unfortunately the detailed information on this product did not arrive on time and Garry did not have much more information to offer. He did say they would be expensive (approx. $50.00 each) but he thought they may have a useful application in snow safety work. A new development in the U.S. is a 'breech loading' avalauncher. The U.S. model does not meet current Canadian standards. Garry has done some development work on a model that would meet the Canadian standards. He presented drawings of his proposed unit and described it's working characteristics.

This launcher has a 4m+ barrel and would fire the 2kg projectiles. It is a substantial unit weighing approximately 200kg and would offer some improvements in range and accuracy. Garry is looking for feedback to determine if there is enough interest to justify production of this new launcher.

94/95 EXPLOSIVE USE, PROBLEMS, AND SOLUTIONS

Dave Metcalf of Explosives Ltd. presented a summary of some of the various problems encountered with explosive products over the past winter and described the methods used to solve them.

The types of explosives used last winter did not appear to have changed from previous years, however there were a few minor problems encountered with Trojan 1000LO manufactured in the last half of '94 and early '95. Some problems were also encountered with low strength detonators in both tailfin and safety fuse assemblies. It appears that some detonators being sold in Canada are manufactured 'offshore' and the problem seems confined to these. The last problem was with a batch of emulsion explosive that is less sensitive than the manufacturer specifications called for and a number of soft detonations were experienced. This may have been compounded with the use of under strength detonators.

These problems have all since been rectified. See the page 16 of this issue of Avalanche News for a more detailed description of the problems and solutions.

Additional comments from Dave were that Explosives Ltd is committed to continue to supply the avalanche industry with high strength detonators. A 'shaped charge' system for artillery dud disposal is now available and is relatively inexpensive ($15.00).

Re: Pre-assembly of hand charges - Dave indicated that manufacturers are working on making this more practical for field use and they support the avalanche industry position on pre-assembly.

DATA STANDARDS PROJECT

Peter Weir gave an overview of the project and introduced the committee members.

The originally proposed timeline for the project has been met. The final draft of the document is complete with the exception of grammar, typo checks, and minor revisions.

Peter summarizes the content of the document and described changes from the old document; he also discussed the manner in which it is meant to be applied.

B. Jamieson reviews the potentially contentious issues in the document re: the title - Standards vs Guidelines.

Colin Johnston points out that the rutschblock test language is not concurrent with the language used to describe the methods used in the other stability tests.

Chris Stethem raises the question of the stability comment in the snow profile not being compatible with the Stability Rating.

Peter Weir is retiring from his job with MOTH and returning to New Zealand. He is thanked by the members for his energetic work on this and other projects.

A.A.A.P. REPORT

John Montagne presents a report on the recent highlights of A.A.A.P. activities. John describes some of the differences between our Associations and the benefits and disadvantages associated with their system.

Their Association membership criteria allows for many more members than the CAA. John mentions that their meetings have lost that small group flavour and the attendant benefits. However, he cautioned against allowing the Association to become 'elitist' by preventing some of the 'front line' avalanche workers from getting involved.

He described the movement in the U.S. by the A.S.T.M. to establish working standards. The U.S. avalanche workers strongly rejected this proposal and put an end to it for now. There is a concern that standards may eventually be imposed on them and that a proactive approach may be necessary.

Stan Bones explained that in the U.S. they are beginning to have supply problems with explosive manufacturers who have indicated they are going to stop supplying cap and fuse assemblies for avalanche control.

WCB - CHANGES IN AVALANCHE BLASTING GUIDELINES

Gary Kreller explained the changes. The present guidelines do not contain the 'proposed' changes to the regulations as made by the blasting subcommittee. Until those recommendations are included in the regulations it is still business as usual. The new regulations should be in place sometime next winter.

Gary indicated that the work of the Canadain Avalanche Association explosive committee has been very influential in effecting changes to the regulations.

The highlights of the proposed regulations are that procedures need only be reviewed annually by the employer and are submitted to WCB for review when changes are made. The 'last most practicable moment' has been redefined to be more acceptable and workable to the avalanche industry.

Paul Orr is the new Blasting Coordinator from Richmond. He reiterated that the current regulations are still in effect and need to be adhered to until the proposed regulations are in place. He asked for submissions of procedures to his office for approval where they will be kept on file.

INSURANCE

Doug Banert indicated that there is very little change in the insurance world in the past year. There have been more legal actions taken recently, however fewer of them have been fruitful due to successful waiver defenses.

He emphasizes the importance of 'standards' in respect to obtaining affordable insurance. He is currently pursuing liability insurance for the A.C.M.G. and feels that there will be something reasonably affordable in the near future.

He feels that waivers will continue to be an effective method of dealing with 'nuisance' legal actions.

The meeting was adjourned at 12:15.

The 14th National Avalanche School

Phase I

- a 5 day classroom session.
- Oct 29-Nov2, 1995 at Copper Mountain Resort, CO.
- cost $325 U.S.

Phase II

- a 3 day field session; requires completion of Phase I.
- cost $150 U.S.
- choice of two kinds of sessions:
  a. avalanche activity at a developed ski area.
  b. safe backcountry travel.

- dates: a.
  - Jan 10 - 12, 1996 Crystal Mountain, WA.
  - Jan 10 - 12, 1996 Alta, UT.
  - Feb 9 - 11, 1996 Crested Butte, CO.
  - Feb 14 - 16, 1996 Alpine Meadows, CA.

- dates: b.
  - Dec 15 - 17, 1995 Crystal Mountain, WA.
  - Jan 26 - 28, 1996 Donner Summit, CA.
  - Feb 9 - 11, 1996 Galena Summit, ID.
  - Feb 16 - 18, 1996 Crested Butte, CO.

Applications and more details are available from the:
National Avalanche Foundation,
133 South Van Gordon St.
Ste. 100, Lakewood, CO. 80228

Canadian Avalanche Association Public Meeting Report

May 3, 1995, Revelstoke, B.C.

Bruce Allen

Seventy-eight people were registered at the 1995 CAA general meeting. The meeting opened with the new President, Jack Bennetto, presenting the out going President, Bruce Jamieson, with a new pair of fat skis and bindings as a gift from the membership of the CAA in appreciation for his outstanding service. A series of presentations by members and guests followed:

1) Alan Dennis\Public Safety Services of the CAA
Alan opened by reading an excerpt from a letter to the CAA from Tracey Telford, the widow of a snowmobiler killed by an avalanche. She highlighted the need for avalanche education in the snowmobile community.

He also discussed: the avalanche bulletin which is extracted from information on the InfoEX (Information Exchange); the statistics on avalanche bulletin use from the winter of 91/92 to the present; the methods of receiving the avalanche bulletin; the avalanche danger scale (low, moderate, considerable, high, extreme), which was accepted at a meeting of the Public Safety Committee; and the possibility/problems of issuing a daily bulletin.

2) Peter Schearer\IKAR report
Eighteen countries belong to the International Commission for Alpine Rescue. Canada is represented by Clair Isrealson.

Peter discussed: avalanche accident statistics, the general trend is a decreasing accident rate although there were still 110 fatalities in 93/94 in the IKAR countries; European adoption of the international danger scale and the associated dissension; the fact that most accidents happen when the danger scale is at "considerable"; that qualifications were determined for dogs and dogmasters; that a "prevention" committee was formed to determine how to reduce accidents with more education and school programs.

Peter then presented Ikar's most recent Avalanche burial survival time statistics which are as follows:

- 17% die in the avalanche;
- after 15 minutes, 19% mortality;
- after 30 minutes, 50% mortality;
- after 1 hour, 77% mortality;
- after 2 hours, 85% mortality;
- after 5 hours, 92% mortality.

The depth of burial is directly related to the chances of survival; deeper = less chance.

3) Karl Klassen\Search and Rescue Video
Karl presented the meeting with a preview of short segments of the CAA sponsored Avalanche Search and Rescue video. The video, which uses a dramatic presentation format rather than the typical educational format, was well received by those present.

4) Stan Bones\Montana Winter Report
Stan Bones was an invited guest speaker from the Northwestern Montana Avalanche Information Center in Bigfork, Montana. He discussed the following: American Standards for Testing Materials in relation to U.S. standards for avalanche mitigation (a very contentious issue); cap and fuse availability for avalanche control (no more American manufacturing); funding for avalanche advisory and forecast centers; communication links-field observations to avalanche center and an advisory message to the public; targeting of snowmobilers with education efforts; and U.S. accidents which had an increase in both number of accidents and fatalities.

5) Grant Statham\Mountain Watch Surveillance Report
Grant outlined Mountain Watch's application of oil patch instrumentation in snowpack studies. Three projects are underway: the Rogers Pass avalanche activity indicator which is basically a trip switch that detects avalanche occurrences; the Galena Pass glide monitors which indicate movement of the snowpack using 4 probes with tilt sensors mounted above articulating bases; and the Lake Louise creep monitors which are 3 probes each having 3 tilt sensors in 3 articulated sections on each probe.

The Rogers Pass project appears to work well. The Galena project seems to indicate movement of the glide slabs but the data needs more study and the probes require refinements due to probe destruction. The Lake Louise project will continue with further improvements to the probes.

6) Peter Weir\Storm Profile Plotting Software
Peter outlined the Ministry of Transportation and Highways graphics program which automatically plots remote weather station observation data. The program presently allows four separate graphs per screen of whatever type of data is collected and from whatever stations are collecting it. The program is fast, flexible, user friendly, and most importantly, reports from field technicians indicate it is extremely useful.

7) Torsten Geldseter\CAA Accident Summary
Torsten states that in Canada during the 94/95 season there were 16 fatalities, with 131 people in 73 involvements reported. This is the highest number of fatalities since the winter of 1971/72. Graphs presented by Torsten showed that most fatalities happened during high danger rating periods. He discussed the reason so many fatalities occurred during this "average" winter. Many accidents involved the uneducated, unaware, and/or unprepared. See page 5 in this issue of Avalanche News for more detailed information.

8) Gord Ritchie\Canadian Ski Patrol System Avalanche Safety Program
Gord gave an overview of the history of the CSPS avalanche program, present activities, basic and advanced avalanche course, and the future plans.

Of the present activities the primary objective is the training of patrollers to be effective members of a rescue team, to be knowledgeable regarding snowpack and avalanches, and finally to promote public awareness. A secondary objective is public education and awareness regarding avalanches. Gord reviewed the objectives and outlines for basic and advanced avalanche courses. Five introductory and one advanced course were held this season with 80 attendees. He also outlined the objective to establish instructor requirements and train future instructors as well as plans to expand programs into B.C., update course slides, strengthen links with national ski patrols, and produce an avalanche pamphlet.

9) Bruce Jamieson\ISSW96
ISSW96 will be held at the Banff Center October 7-10/96. The organizing committee is T. Daffern, T. Riley, M. Boissonneault, A. Wilson, C. Watson and C. Stethem.

10) Chris Stethem\Avalanche Safety at the World Extreme Skiing Competitions
Chris showed a slide presentation on his work doing snow safety for the World Extreme Skiing Competition outside Valdez, Alaska. Needless to say it was very interesting.

11) Bruce Jamieson\Compression Test Study
Bruce discussed a preliminary study on the compression test which is commonly used in the Rocky Mountains. The study was conducted for 5 days this past season in the Bobbie Burns and at Blue River. The study consists of finding an instability in a snowprofile then doing the standard compression test (isolate the block, use 10 taps from the wrist, elbow and if necessary shoulder) with the full depth of snow over the weakness and compared with 10 centimetres of snow over the weakness. Numerous test were done beside each other alternating from full depth to 10 cms. It was found that the deeper the layer was from the surface of the block the harder it was to cause failure. A guarded opinion from Bruce was that the compression test will work well in all snowpacks. Further study is continuing.

12) Al Wallace\AES/MWSO (Mountain Weather Services Office)
Al discussed the reductions in Environment Canada's budget as follows: one third cut in three years; 55 local weather offices closed; and AES's endeavor to "modernize, harmonize, rationalize and commercialize". Their focus will be on "high priority areas".

The Mountain Weather Office will be staying in Kelowna. Al discussed the tools they will be using for delivery of the weather forecast products: weather radio; automatic answering devices; 1-900 presentation services; fax back service; bulletin board service; Met PC; and contracted services.

13) Laurent Mingo\Testing of the Snow Cover Numerical Model "CROCUS"
Laurent outlined how CROCUS integrates weather factors to build a simulated snowprofile model. He reviewed, using graphics, actual snowpack amounts, densities, snowpack temperatures, and water equivalents in relation to CROCUS simulation. The relationship appears to be satisfactory, however, there were problems with snowgrain characteristics. It appears the problem is that the simulation creates facets to early but Laurent believes he may have a solution using density and grain pore space. As well surface hoar is not simulated by CROCUS but studies are revealing clues as to how and why it forms. This may allow for the future inclusion of surface hoar in the model.

14) Anton Horvath\CARDA Activities
Anton discussed the following: 2 training and validation courses were held this winter, one at Blackcomb in January with 20 teams in attendance and an advanced course in Invermere in March with 4 teams in attendance; there are currently 20 operational teams and 10 teams in training; the membership consists of 45 active members and 11 associate members; there were 7 "code alpha" responses, 5 turned back as victims were recovered and 2 body recoveries by attending teams; a NSS grant was received which was used to buy rescue and communication equipment for all handlers as well as assorted audiovisual equipment and training aids for courses; all validated teams will have pagers for 95/96 season; the annual exchange with the German Bergwacht Avalanche Rescue Dog training program will continue and CARDA will notify the CAA of the 95/96 course dates.

Incident Reports

Rich Marshall\Esplanade March 16, 1995
Rich outlined an avalanche accident that occurred involving a ski touring party in the Esplanade range outside Golden. 11 members of a group of 14 were caught with a broken leg as the only resulting injury. An interesting fact was that the avalanche fracture line ran through the snowprofile hole which was dug to determine if the slope was safe to ski. Rich discussed the observations made in the profile and those at the fracture line as well as the probable cause of the release.

Kevin Marr\Jackson Basin February 19, 1995
Kevin gave a slide presentation showing the slope on which the avalanche occurred and the area in which the party was touring and from which the victim was rescued. He discussed the accident according to accounts given by the members of the party. It appears that the party chose to ignore obvious indicators of peril, including warnings from snowmobilers in the area.

George Field\Burstall Creek February 19, 1995
George outlined an avalanche accident that occurred in the Kananaskis area to a group of members of the Rocky Mountain Ramblers ski touring club. 5 people were caught, 2 partially buried, 3 totally buried with 1 fatality. No one had transceivers as they did not believe they were in avalanche country.

George Field\Bath Glacier to West Lake Louise Traverse March 17/95
Using slides George outlined another accident in which 3 out of a party of 4 were caught and buried. Two were found by clues and one by transceiver. The only injury received was a broken ankle believed to have occurred in the victims haste to get out of the hole.

Brad White\Kakwa Wilderness area March 5, 1995
Brad showed a slide presentation on an avalanche accident involving 5 snowmobilers. It appears one member of the party triggered a slide which initiated a second avalanche burying and killing another member of the same party. The group were "highpointing" on Broadview Ridge. The deceased was on the slope, at the time of the avalanche release, trying to get his machine unstuck. None of the party had any

rescue gear or avalanche training. An unfortunate aspect of the accident was that a Parks Canada rescue team enroute to the accident site was called off and returned home before the victim was found. This was due to lack of knowledge and a break-down in communications with the R.C.M.P. officer in charge at the accident site. The same rescue party returned the next day to recover the body.

It is interesting to note that experienced snowpack observers were unable to observe any obvious instabilities in fracture line profiles done at the site.

Open Discussion

The issue of whether or not to keep a pack on when caught in an avalanche was raised. It was agreed that in certain circumstances, such as a ride down over cliffs, the pack may protect a person's back but in circumstances where the pack is heavy it may result in deeper burial.

George Field proposes that the CAA executive consider a more "user friendly" definition for the danger rating scale.

Chris Stethem raised the question of whether we should consider having avalanche danger scale bulletin boards, like those used by the forestry for fire hazard. It was stated by certain members that they were considered in some areas but as avalanche conditions change rapidly with time and space the idea was rejected.

A question was asked as to whether the avalanche rescue balloons saved lives. No definitive answer was available but testing is being conducted in Europe this year.

The avalanche weather course is still proposed for the fall of 1995. The AES contact is Ken Little at the Mountain Weather Services Office in Kelowna.

Jim Frankenfield requested information for input into an Internet public education bulletin/advisory. Any wishing to assist can contact him at, 1338 Foothill Dr., #170, Salt Lake City, Utah, USA, 84108. (See article on page 10 of this issue.)

Industry Information Exchange

Torsten Geldsetzer

The 1994/95 InfoEx season was very successful. We welcomed 5 new subscribers: Big White, Sunshine Village, Skiing Louise, Sun Peaks (Tod Mtn), and Mountain Consultants (Herb Bleuer). Two thirds of the subscribers sent in their input by modem and by next season we hope to increase this to 90%.

Many thanks go to Laura Howatt for all her work on the InfoEx this past season and also congratulations on becoming a mom; she and Bruce had a boy on May 24.

The InfoEx meeting at the AGM brought up a few initiatives that we will be trying next season:

First, to solve the problem of insufficient input from some operations we are going to try peer pressure. If we don't hear from you for four days and we know you are operating, your name goes into the NEWS section under an appropriate heading such as "INPUT SLACKERS".

Another thing we are going to try is a separate section on the weather page for the daily summary observations. This will highlight the different nature of these readings and not confuse the picture we get from the fixed weather stations.

In addition to seeing the involvements in the NEWS section each day (if there are any), there will be an avalanche involvement summary at the end of each month. This will be attached to the InfoEx on the last day of each month as well as being available as an individual file.

There will be a new price structure for the InfoEx next season. Operations that only operate for one or two months will now be able to subscribe for $300 per month. The cost for regular InfoEx subscribers will stay the same, $800 for the season. If applicable, there will be a surcharge for faxing the report ($15 per month) and/or typing the input ($ 20 per month).

There may also be an input screen program available for subscribers next season that would make life easier for everyone. Stay tuned.

As before, operations wishing to become subscribers to the InfoEx must have a CAA member in a supervisory position. So if your operation would like to join the InfoEx next season then please apply now for your supervisor's membership to avoid any delays at the start of next winter.

Thanks again to everyone for their support of the Information Exchange.

SARSCENE 95

Search and Rescue Conference, October 19-21, 1995, Kelowna, BC

The fourth workshop sponsored by the **National Search and Rescue Secretariat** will be held 19-21 October at the:

Coast Capri Hotel
1171 Harvey Avenue
Kelowna, BC.

The conference, part of **SAR Expo 95** and held in conjunction with the **North American Technical Rescue Symposium** and the **Wildlands Rescue Workshop,** will present a wide range of sessions.

Hotel accommodation is available at a special conference rate at the Coast Capri Hotel: 604-860-6060, 1-800-663-1144 (Canada) or fax 604-762-3420

There is no charge for attendance, however a registration is required. Please mail or fax the form to the Secretariat to register.

Mail to: The National Search and
Rescue Secretariat
275 Slater Street
Ottawa, Ontario, K1A 0K2
Fax: 613-996-3746/Tel: 1-800-SAR-9414

Trip Plan for Outdoor Survival

compliments of: Provincial Emergency Program (PEP)
455 Boleskine Road
Victoria, BC, V8Z 1E7

Complete this form prior to an outdoor adventure, leave it with a responsible person. YOUR LIFE MAY DEPEND ON IT! In the event that you do not return from your trip as stated in this trip plan, it will be given to police and search and rescue organizers.

OUTDOOR TRAVEL TIPS

- **Be prepared for your chosen recreation**

Being fit enough to go the distance takes physical preparation. Stick to your turnaround time. Take the proper equipment, have a trip plan and use reference and guide books.

- **Always carry the essentials**

If necessary, be ready to stay out overnight. Carry a flashlight—many people become lost because of darkness.

- **Complete a trip plan and leave it with a friend**

The trip plan explains your destination, the route you are taking, who is in the group and your return time. If you do not return as planned, the friend you left the trip plan with can give the form to the police to initiate a search.

- **Never hike alone**

Hike with a group and keep together. Travel at the speed of the slowest person. If a person becomes separated by going ahead or falling behind, they are more likely to become lost.

- **Do not panic**

Maintain a positive mental attitude if you become lost. Being lost is not dangerous if you are prepared.

- **Stay where you are**

People who carry on after they become lost usually get further from the trail and further from people who are looking for them. Also, going downhill often leads to natural drainage. Gullies which typically have very thick bush, expansive cliffs and waterfalls make travel and searching more difficult.

- **Use signalling devices**

Blowing a whistle, lighting a fire and staying visible will help searchers find you. Help searchers find you even if you are embarrassed or afraid. Remember that animals will not be attracted to your signals. Searchers may also use planes or helicopters—make yourself visible to them.

- **Build or seek shelter**

Protect yourself from the rain, wind and excessive sun. Be as comfortable as possible, but when it is daylight, make sure you are visible to searchers in helicopters or planes.

- **The most common mistake**

An individual's belief that "it could never happen to me" is summed up as EGO. By being prepared, you can enjoy your trip outdoors regardless of what nature throws at you!

DETACH AND TAKE THIS HALF WITH YOU

START: /
Day of Week Date Month

INTENDED RETURN: /
Day of Week Date Month

PURPOSE OF TRIP:

- ☐ Day Hike
- ☐ 1/2 Day Hike
- ☐ Overnight Hike
- ☐ Climbing
- ☐ Fishing
- ☐ Hunting
- ☐ Skiing
- ☐ Snowmobiling
- ☐ Canoeing/Kayaking
- ☐ Mushroom Picking
- ☐ Other:

THE TRIP:

General Area:

Specific Area:

Intended Route in (be specific):

Intended Route out (be specific):

Destination:

Local Landmarks:

Map Used:

BC Hunting & Fishing Regulations Management Unit:

Fresh Water Fishing Regulations Synopsis Unit:

DETACH AND LEAVE WITH A FRIEND

TRANSPORTATION TO & FROM
THE STARTING POINT:

Vehicle License No:

Make/Model: Colour:

Owner:

or **Dropped Off At Starting Point By:**

Name: Phone:

To Be Picked Up At End Point By:

Name: Phone:

Time: Date:

Location:

Other rendezvous points used by the group:

EQUIPMENT/SUPPLIES TAKEN:

- ☐ Backpack
- ☐ Water
- ☐ Firestarter
- ☐ First Aid Kit
- ☐ Flashlight
- ☐ Whistle
- ☐ Avalanche Beacon (PIEPS)
- ☐ Snowshoes
- ☐ Stove
- ☐ Skis
- ☐ Extra Clothing
- ☐ Sun Protection
- ☐ Tent (colour):
- ☐ Food (days per person):
- ☐ Radio (type & frequency):
- ☐ Signalling Device:
- ☐ Personal Locator Beacon (PLB #):
- ☐ Cellular phone #:
- ☐ Firearms:
- ☐ RV, ATV, Boat (description):

DESCRIPTION OF THIS TRIP'S MEMBERS:

DETACH AND LEAVE THIS HALF WITH A FRIEND

	Person 1	Person 2	Person 3	Person 4
Last Name				
First name				
Disability				
Age				
Height				
Weight				
Hair & Skin				
20/20 Vision				
Family Doctor				
Hat Colour				
Coat Colour				
Shirt/Sweater				
Pant Colour				
Footwear Type				
Survival Training				
Outdoor Experience				
First Aid				
Avalanche Awareness				
Skier				
Snowshoer				
Other				

THE FOLLOWING WILL BE NOTIFIED IF I / WE CHANGE DESTINATION:

Name: _____ Address: _____

Home Phone: _____ Work Phone: _____

PLEASE NOTIFY THE POLICE IF I / WE DO NOT RETURN BY:

Date: _____ Time: _____

Signature: _____ Date: _____

OUTDOOR TRAVEL *ESSENTIALS*

DETACH AND TAKE THIS HALF WITH YOU

- Map of the area and compass. **KNOW HOW TO USE THEM!!!**
- Large orange-coloured plastic bag useful as emergency shelter, signalling device or rainwear.
- Flashlight and spare batteries.
- EXTRA food and water.
- EXTRA clothing—rain and wind clothes, toque and gloves, sweater and warm pants (NOT jeans!)
- Sun protection—sunglasses, sunscreen, hat, long-sleeved shirt and pants.
- Pocket knife.
- Waterproof matches and/or a full lighter.
- Candles and/or firestarter (efficient fire-building in adverse weather must be learned before you venture out!)
- Ensure weather forcast and hazards (eg. snow conditions) are checked prior to departure.
- First aid kit—(training is required to develop skills needed for proper first aid.)
- Extras—whistle, small lightweight ground insulation such as "insulite", projectile-type flares, tarp.

REMEMBER: bad weather, early darkness or an unexpected injury can turn any outing into an extended crisis!

Provincial Emergency Program

Province of
British Columbia

Copies of this Trip Plan are available from the
Provincial Emergency Program
455 Boleskine Road
Victoria, BC
V8Z 1E7

94/95 Explosives Use, Problems & Solutions

Dave Metcalf

In the 1994 / 95 avalanche season, the types of explosives used did not appear to have changed from the previous years. A combination of Cast Boosters, NG products, Emulsions, and ANFO's were in use along with the standard Safety Fuses, Detonators, and Pull Wire Lighters.

All of these products performed well considering the extreme conditions that they tend to be placed under. There were instances were a few products experienced minor problems due to a variety of reasons. These problems are listed below along with some of the solutions. Please keep in mind that what is being presented here is only what has been brought to my attention and other instances may have occurred.

1. Avalauncher Payloads and Tailfin Assemblies.

PROBLEM: During the middle part of the season, some areas experienced high rates of misfires with payload charges, particularly the Trojan I 1000LO. It had been noticed that the tail fin assemblies were not sitting fully onto the payload base adapter. It was determined that an air gap of 1/4" to 3/8" existed between the detonator well in the base adapter and the primer barrel in the tail fin. This resulted in situation were the full energy of the primer may not have been directed up into the cap well and detonator. Further investigation showed that the out side diameter of the base adapter had increased when a change of suppliers occurred. This changed occurred without the knowledge of the booster or tail fin manufacturers.

Be aware of payload boosters with a light-medium blue adapter base. These will appear on Trojan payload boosters manufactured in the last half of 1994 and early 1995. Other payload suppliers may also experience this problem. Payloads with darker blue bases are of prior manufacturing dates and still fit and function well.

SOLUTION: To insure that new charges are easily recognized the adapter color has been charged to red. Be sure to test fit all tail fins to the booster before installing the detonator. If you find some of the tight fitting boosters there is a tool available that will open up the internal diameter of the tail fin to ensure that they fit your boosters.

Another solution is to use spacer disks that are designed to fill the air gap. These disks can be made from 1/8" plastic and using a 1 5/8" hole cut saw with a center tap bit, cut as many as is required to use up your inventory. Normal only 2 disks have been required to fill this air gap.

NOTE: Reports out of the USA that there have been occasions of multiple misfires with payload charges when using a variety of offshore detonators. This may have been due more to the use of lower strength detonators. It has also been noticed that in many areas temperature has an effect on the strength of detonator needed to initiate a charge. (i.e. the use of #6 strength detonators is common is some areas. As the temperatures drop they have found that a #12 strength detonator is required for reliable initiation.) Please note the strength of your detonator, in Canada most hi-strength detonators are #8 plus or #12.

2. Safety Fuse Assemblies

PROBLEM: One of Canada's major suppliers has discontinued Canadian manufacturing of Safety Fuse Assemblies (SFA) and is now importing the product from offshore. The first shipments of these, contained only #8 strength detonators which can contribute to incomplete detonations and possibly even misfires in some types of explosive products. The new SFA's which started to arrive in early 1995 are called MANTSTART H.S. and contain #12 strength detonators.

SOLUTION: Be sure when you are ordering SFA's to specify H.S. or high strength.

3. Emulsion Explosives

The use of emulsion explosives has been somewhat slow in catching on in the avalanche control industry. This product was developed primarily to provide an alternative or safer explosive than NG or cast products.

PROBLEM & SOLUTION: During December 1994 there were reports of soft detonations when using the emulsion. This turned out to be a two fold problem that compounded itself. First was the use of low strength detonators, because emulsions are less sensitive they require more initiation strength than do other explosives, a high strength (#12) detonator should always be used. Secondly, it was determined that one production lot dated January, 1994 was slightly less sensitive than manufacturing specifications called for. These two items combined to give the soft detonations that were experienced. It is believed that all material from this lot date has been traced, pulled from inventory and returned to the manufacturer.

EDITORIAL NOTE

The intention of *AVALANCHE NEWS* is to assist communication among persons and organizations engaged in snow avalanche work in Canada. Short articles cover accidents, upcoming and past events, new techniques and equipment, publications, personal news, activities of organizations concerned with avalanche safety, education and research.

The editor welcomes and expects contributions; all reasonable comments and discussions will be printed. The articles in *AVALANCHE NEWS* reflect the views of the authors; only when it is specifically stated do they represent the opinion of the Canadian Avalanche Association.

No paid advertisements are carried. Suppliers who wish to draw attention to their products should send information to the editor who will publish a note when equipment has value in avalanche work and safety.

***AVALANCHE NEWS* is published three times per year. There is no subscription fee. Requests for copies and changes of address should be sent to the publisher.**

The Canadian Avalanche Association (CAA) proposal to the Association of Professional Engineers and Geoscientists of British Columbia (APEGBC)

The CAA has been discussing the potential for its members to apply for Limited License with the APEGBC. The formal part of this process was initiated at a meeting in Kamloops, October 23, 1994, attended by interested members of the CAA. The goals were to establish the CAA position and determine the contents of a proposal. A consensus was gained by attendees and a proposal was forwarded to APEGBC, for their consideration.

This proposal was forwarded on November 15, 1994, defining the following three categories of snow avalanche related work:

- Avalanche design work, including impact forces, runout distances and return intervals for avalanche paths affecting permanent structure.
- The responsibility for planning and specifying the requirements for new and/or extensive changes to avalanche safety programs.
- The planning, specifying, supervising, and carrying out of active avalanche safety and control measures.

These categories were defined in greater detail and included recommendations for avalanche professional qualifications. Copies of this proposal were made available at the Annual meeting in May 1995.

The APEGBC confirmed receipt of our proposal by identifying that it was a very well thought out and presented proposal. It would be given serious consideration when the process for Limited License application became more clearly defined.

APEGBC has modeled their Limited License certification process along the lines of the one that is in existence in Ontario and APEGBC has established a schedule to complete the process, in 1995, as follows.

- January 20: Define limited license
- February 9-April 20: Develop the application process, which includes:
  - application procedure
  - term of license
  - upgrading procedure
  - liability and insurance
  - practice review
  - investigations and discipline
  - participation of licensees in APEGBC activities
- April 8: Meet with Applications an Geoscience Committees
- April 20: Report to the Council
- June 1: Revise the report
- June 15: Define a limited license subcommittee, if required.
- September: Process the first applications

On April 24, 1995, the CAA received a draft proposal that defined the Limited License Application Guide. Comments on this draft will be forwarded to APEGBC prior to the deadline of May 12.

Representatives of the CAA will meet the APEGBC limited license committee on May 17 to present the CAA position concerning professional licensing with APEGBC. The meeting will be chaired by the Director of Professional Practice, APEGBC. The CAA will be represented by P. Schaerer, C. Stethem, D. McClung, and J. Bennetto.

Jack Bennetto and Peter Schaerer can be contacted for further information on this subject.

Canadian Avalanche Association Avalanche Rescue Video

Karl Klassen

The Avalanche Rescue Video project started last August with Text and Image of Calgary as the production/project management contractor. One of the mandates was to produce a video that was different from those currently on the market. The target audience was defined as recreationists who have little (or no) experience, avalanche awareness course and Level 1 participants, and organized rescue groups. Such a diverse audience made creating a viable concept and script a major challenge.

It was decided to produce an *educational drama* which tells a compelling story but maintains technical accuracy. This drama will appeal to a wide range of viewers and illustrate techniques for preparation, travel, awareness, self rescue, and organized rescue in avalanche terrain.

Essentially the story involves several groups of people: ski tourers, snowmobilers, rescuers, etc. some of whom are well prepared and others who are not. By showing the potential results of varying levels of preparedness and knowledge, the message of avalanche awareness and rescue will be sent.

Because the production is a drama, it will be of interest to nonprofessionals and audiences with little technical knowledge. Since it is technically correct, it will be useful as a teaching tool for avalanche courses at the awareness and Level 1 stages as well as for those involved in rescue groups.

A professional crew and cast have been contracted to produce and act in the video. The production is being shot in the Valemount area. Local and industry support has been excellent. At this time the dramatic portions of the video are nearly finished. Next winter will see completion of the drama, shooting of background footage (e.g. avalanches in motion, scenics, skiing, snowmobiling, etc.), and final post production work.

Plans are currently being formulated for marketing and distribution. The production will be completed by May of 1996.

Snow and Avalanche Information on the Internet

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The internet is a global computer network accessible to much of the developed world. It has grown at an incredible rate in recent years and continues to expand rapidly. Somewhat hidden, behind all the hype, lies a unique and potentially powerful means of disseminating bulletins and warnings, educating recreationists, raising public awareness and appreciation, and communicating with other professionals.

What is the Internet?

The original concept was developed by the RAND Corp. for the US Department of Defense. The idea was a network with unlimited routing possibilities which would be essentially impossible to disable. Despite efforts by the DoD to prevent it, their programmers took this technology into the public domain. It was first used among programmers, then became more common throughout university communities. Today there are many commercial service providers, making it easy for the general public to get connected via modem.

A good history of the internet can be found in Rheingold(1).

There are many services, or ways of sharing information, available. Some of the most relevant ones are:

Electronic Mail, or e-mail - Sort of like postal mail, but quicker and free. It is highly reliable and messages can be sent around the world.

File Transfer Protocol, or FTP - This lets one user get a file (of any kind) from another user. There are ftp sites where information is stored and publicly available for retrieval.

Gopher - A "client/server" system. With your gopher client you can connect to gopher servers around the world to retrieve all kind of information. This is usually menu driven, and the user just follows a chain of selections.

USENET - A huge collection of bulletin boards covering any topic you can think of. It's like following anywhere from a few discussions to hundreds, simultaneously.

World-Wide-Web or WWW - The latest in internet technology. Web pages' are full of graphics as well as text (and sometimes sound as well). Pages are usually linked to other pages, one click on the mouse can take the user from one information site to another on the other side of the world. This combines ftp, gopher, and other services into one system.

Most service providers make all these, and more, available. They can usually help you get started using them as well.

Snow and Avalanche Information

So how does one use all these tools to get information related to snow and avalanches? There is currently a gopher server with bulletins, course listings, and miscellaneous educational information. There is also a discussion forum via e-mail for professionals.

The primary site for such information is currently the gopher server at the University of Utah. Bulletins from Canada, Utah and Montana (SW) are submitted daily via e-mail, and are immediately available to the public. These are archived, so the entire seasons bulletins are available. The Northwest US bulletins and the Scottish bulletins are both available and archived also. These are transferred over the network rather than submitted directly so there is sometimes a delay before they are available. Swiss bulletins in all three languages and Italian bulletins are available via a link, but are not archived. A pointer to an existing Swiss archive will be in place soon. Warnings for Colorado are available, but not daily bulletins.

Also available on this system is a list of phone numbers for current conditions worldwide, a list of avalanche education classes, and some educational material. An on-line logging system is now in place, so anyone looking at the menu can check on how many times an item has been accessed and where it was accessed from.

For professionals, a discussion forum in newsletter form was recently implemented. Input can be sent in via e-mail. It is collected and sent out in newsletter form. This is new and the amount of discussion is still low, so an 'issue' is sent out every few weeks unless something urgent is submitted. It would be nice to have something more or less weekly by next season. This is a good way to ask questions about things, raise issues, announce things, etc. Currently the list includes both scientists and practitioners from 7 different countries.

To join this send e-mail to frankenj@oce.orst.edu.

The On-line Community

In the past, the internet was a powerful community building tool. People with common interests would set up information sites, communicate via email, and discuss things on bulletin boards. A great review of this aspect can be found in Rheingold,(1). The advent of the WWW is changing the nature of the internet rapidly, bringing businesses onto the scene with flashy advertising and info 'feeds'.

Despite the changes, the current snow and avalanche services are still community oriented. Everything has been done with donated computer space (by the U of U), donated technical support, and volunteer efforts. Awareness has spread through related USENET bulletin boards, and snow and avalanche issues are sometimes discussed there.

A community requires input from its members. All snow and avalanche professionals are invited and urged to participate. Join the newsletter. Contribute educational materials for the gopher site (you can send a disk via mail if you are not connected yet). Suggest new things or improvements to the current systems. Feel free to contact the author.

Internet Site Addresses

Snow and Avalanche Center:
University of Utah main gopher server (gopher.cc.utah.edu) under 'News and Calendars'

Newsletter:
e-mail to frankenj@ucs.orst.edu

Questions, problems, feedback:
snowman@aip.org

References:

1.) Rheingold, Howard; "The Virtual Community"; Addison-Wesley, MA; 1993

Public Safety Services of the Canadian Avalanche Centre

Avalanche Danger Scale

In the Fall 1994 issue of Avalanche News the new Danger Scale was described. It was used this winter by all agencies in Canada who prepare avalanche information for the public; Kananaskis Country, the mountain National Parks and the Canadian Avalanche Centre. The print and broadcast media also used the new Danger Scale. Teachers of avalanche awareness courses introduced the new scale in their courses.

Similar to the introduction of any new scheme (e.g. metrication) there were concerns. These were discussed by the CAA Public Safety Committee. The most difficult concern was the name of the middle rating of the Danger Scale. It was decided to use the 'European' word CONSIDERABLE. After the experience of the winter and comments from the public it appears this word reasonably describes an avalanche condition. As is the nature of any compromise, not everyone is completely happy.

It is still recognised that there is a need to refine some of the 'European' definitions. This is for reasons of semantics, literal translations from five languages, ambiguity and clarity. It is not an easy task. The most important consideration is for good communication to the public who have varying levels of avalanche expertise.

Some Avalanche Bulletins are prepared for huge geographic zones. One zone has 15-20 observations sites, some of which report irregularly. In Switzerland, an equivalent alpine area, there are over 50 reporting sites. It is difficult to make a detailed Bulletin with a limited network of technical observations. Most avalanche services in north America do not have the resources for a wide variety of products for different users. For example an ice climber has different information needs than a snowmobiler. The comparison with the AES is obvious. They have different products for different users.

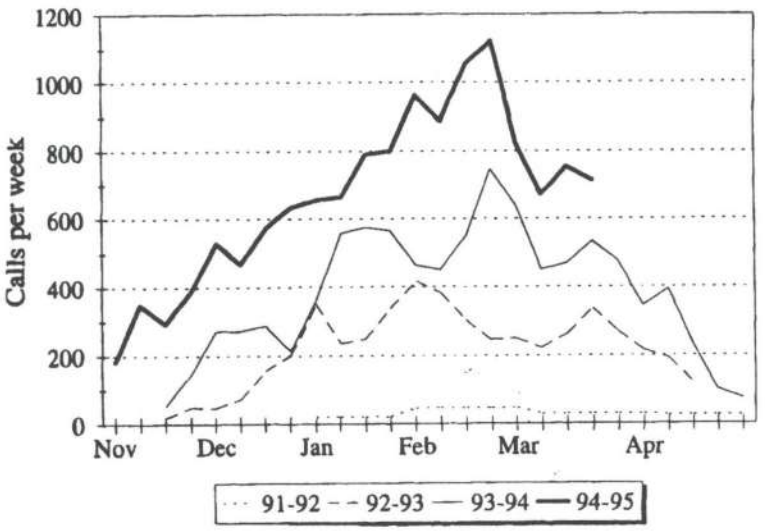
The goal to have some standard terminology is worth making some compromises for. This stimulating challenge continues. Avalanche specialists preparing public information appreciate the dilemma.

There is no question that public avalanche information helps save lives. Even though there are grim reports of avalanche accidents in this issue, we know there are many good stories of the group who stayed at home, adjusted their route or turned back because of advice they received in a Bulletin combined with their judgement and on-the-spot decisions. These stories do not make headlines or broadcasts on TV.

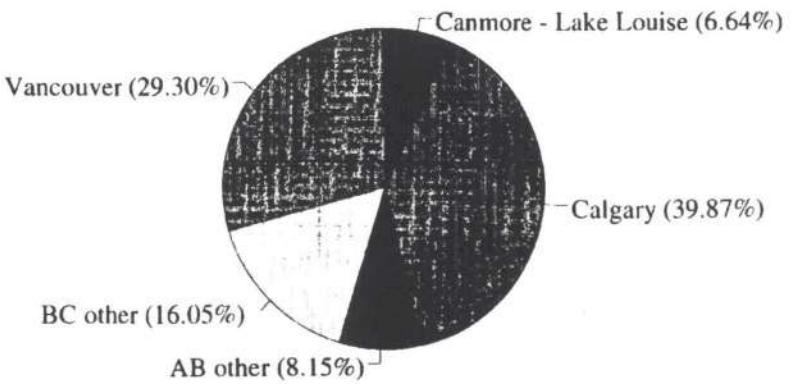
The graph (below left) illustrates increasing use of the Bulletin over the past four years. The Bulletin is also available on internet, local cable TV, fax network, and PCBBS.

This work could not succeed without the support of sponsors on the back cover.

Avalanche Bulletin - Phone Services



Avalanche Hotlines - Use by Area
1994/95



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