

## The Canadian Approach to Professional Avalanche Training

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**ABSTRACT:** Canada is in a unique position with: low-density populations scattered over large mountainous areas of differing snow conditions; limited access to government-organized observation and warning networks; the highest concentration of mechanized guiding operations; and highway and transportation corridors travelling through extensive wilderness areas. As a result of these factors, a person in charge of snow safety in Canada must be self-reliant in making observations and evaluating the local snow stability and avalanche hazard. The Canadian Avalanche Association (CAA) delivers a comprehensive array of training for avalanche professionals through its Industry Training Program. This program prepares workers to be responsible for avalanche safety in industries such as ski areas, highway operations, railways, mines, and guiding. Successful graduates from Canadian avalanche courses are expected to not only move safely in the backcountry but also to make decisions independently. In order to assist industries and operational staff with this challenge, the CAA has developed a training program with exceptionally high standards. Over the past decade, the CAA has received an increasing number of international inquiries regarding its professional avalanche courses. This paper explains the unique history that has shaped the Industry Training Program, and shares the evolution of its objectives and methodology.

**KEYWORDS:** professional avalanche training, Canada, avalanche industry, avalanche education

*“The CAA’s avalanche education curriculum is the gold standard in my and many other US avalanche professionals’ opinion.”*

Sue Burak, Eastern Sierra Avalanche Centre.  
Inyo County Avalanche Hazard Consultant

### 1 INTRODUCTION

Canadian professional avalanche training has an international reputation for excellence. Several factors unique to Canada have contributed to the way this training has been developed and the high standards that have resulted.

- An early European influence stressed standardized methods of observation & recording techniques with a high level of professionalism
- As the birthplace of helicopter and snowcat skiing, Canada has the world’s highest concentration of mechanized winter guiding operations.
- The profession has advanced through frequent dialogue between sectors, inter-agency partnerships, collaborative agreements and an industry information ex-

change that keeps operators informed of snow, weather and avalanche conditions.

- Canada’s geography and climate demand a comprehensive approach. Our mountains cover a broad spectrum of geo-climatic zones and in many places are sparsely populated. This extensive wilderness means professional operations must be largely self-reliant.
- Federal government funding has played a vital role over the years, supporting projects that have allowed significant advances to be made in the avalanche safety field.

### 2 HISTORY

Professional avalanche training in Canada began in 1971 to address a pressing need for educating avalanche control workers. Historically these courses were delivered through a variety of organizations—the National Research Council of Canada, British Columbia Institute of Technology, and Selkirk College, until the Canadian Avalanche Association (CAA) assumed the administration of the courses in 1989.

Currently the annual budget of the CAA’s Industry Training Program (ITP) is approximately 900 thousand dollars and student numbers have quadrupled since the early 90’s with over 800 students per winter season. Courses are offered in the provinces of British Columbia, Alberta, and Quebec in order to expose students to a variety of snowpacks and to make the courses more accessible across Canada.

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Over the years, courses have evolved to include human factors and decision making in order to better prepare avalanche professionals for leadership roles within avalanche hazard control operations. Consequently course curriculum now includes topics such as situational awareness, teamwork, risk theory, learning styles, organizational communication, avalanche hazard, and risk management.

As a result of their avalanche education, CAA graduates continue to pursue learning opportunities and mentorship, to contribute to the professionalism of the avalanche industry, and to incorporate their awareness of human factors into their workplace.

### 3 PROFESSIONAL TRAINING PROGRESSION

Several bodies contribute to the development of the ITP including a Board of Directors, an Education Committee, a Steering Committee, and a Professional Practices Committee. Each of these groups includes representation from industry employers, avalanche professionals, researchers, and educators. Likewise subject matter experts and educational personnel are involved with regular updates and improvements to the various course curricula.

The first step in the Canadian system of professional training is the Avalanche Operations Level 1 course. This is the essential prerequisite course to many other industry training programs including backcountry guiding. Level 1 graduates might be responsible for taking on an avalanche field technician position, collecting snowpack, weather and avalanche occurrence data.

Figure 1 illustrates the general progression through the ITP, where all professional development courses can be taken upon completion of the Avalanche Operations Level 1 course.

Similar to the Avalanche Operations Level 1 course is a 5-day course called Resource & Transportation Avalanche Management. It is designed to address the needs of superintendents, managers, contractors, equipment operators, and technicians coming from transport maintenance, mining, transmission line, forestry and highway construction sectors. Its goal is to assist in the recognition and evaluation of risks associated with work in avalanche terrain.

The next step in the progression is the Avalanche Operations Level 2 program which consists of 3 modules. Participation on the Level 2 requires at least 100 days of operational field experience, making and recording weather, snowpack and avalanche activity observations. This generally requires applicants to have at least two years of active operational field work under the mentorship of CAA professional members. Successful graduates of the Operations Level 2 program might be expected to take on the role of avalanche forecaster or avalanche control route leader.

The Operations Level 3 is an applied avalanche risk management course intended for avalanche workers employed in forecasting, management, and/or planning positions. Applicants must have at least 5 full time seasons of experience in the avalanche industry before applying for this course. By the end of this course, students are better able to analyse, assess, forecast and communicate avalanche hazard & risk using ISO 31000 terminology. Course evaluation requires students to produce a report and oral presentation that demonstrate application of the concepts and language taught on the Level 3 course in their work place.

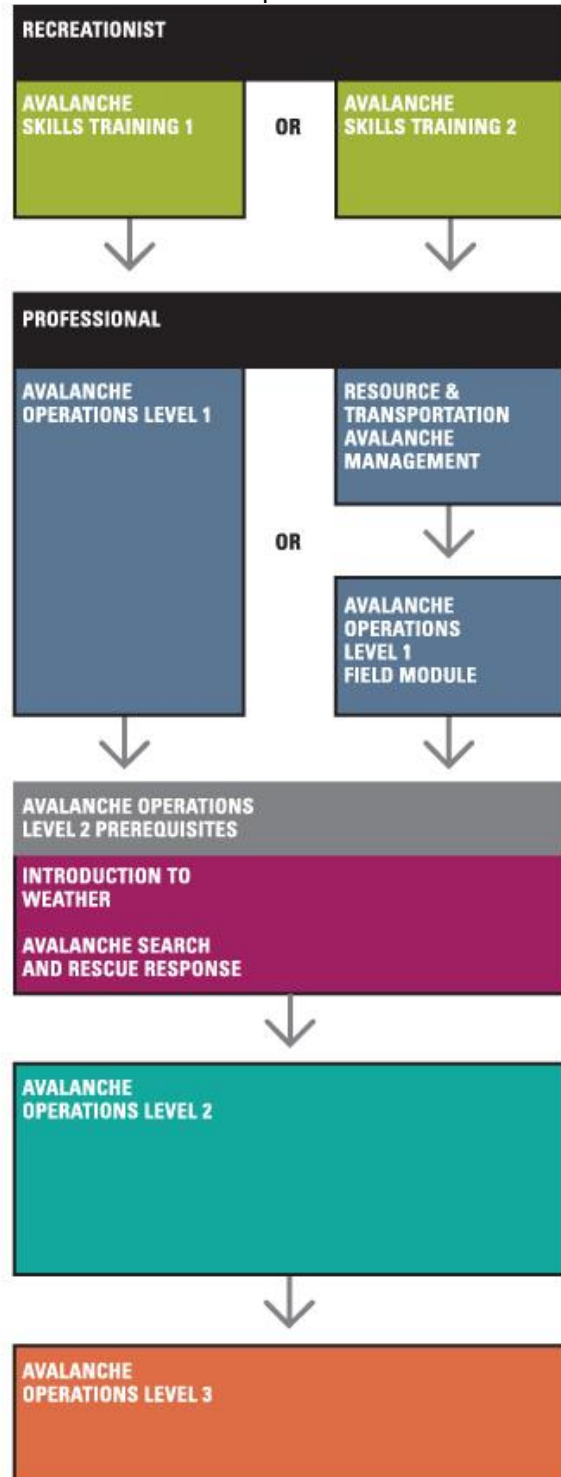


Figure 1. The progression from recreational to professional avalanche training

There are several opportunities for on-going professional development through the ITP, including courses on:

- Avalanche Control Blasting
- Introduction to Weather
- Advanced Weather
- Avalanche Search & Rescue Response
- Introduction to Snow Avalanche Mapping

All ITP courses receive regular review, improvement, and updating in order to ensure that industry needs are being met, current best practices utilised, innovative research included, and educational standards upheld.

#### 4 INTERNATIONAL INITIATIVES

The Canadian professional avalanche course curriculum delivers a high standard of training that has proven adaptable to many other alpine countries. For over a decade, ITP curriculum has been utilised in countries such as Japan, New Zealand, Iceland, and Russia. As well, students come from all over the world to attend courses in Canada, particularly the Avalanche Operations Level 1 to 3 courses.

The quality of training and reputation of avalanche training in Canada is a result of the dedication of the CAA instructors, committee members, subject matter experts, and educational personnel who review and improve the course content.

#### 5 CONCLUSION

The foundations for professional avalanche training in Canada were laid over 40 years ago. Western Canada's vast mountains, remote transportation corridors, and famous winter recreation have all contributed to a need for an innovative and comprehensive approach to avalanche safety. An early European influence emphasized standardization and professionalism, and government funding of special projects allowed important advances to be made. Today, the CAA's Industry Training Program offers a renowned series of courses recognized across the world for preparing professional avalanche workers for the challenges they face.

#### 10 REFERENCES

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