

# Course Avalanche Risk Management Guidance - Support for Providers and Instructors

Revised July 2022 by Steve Conger AIARE Technical Director

This document is an addendum to the course provider agreement and presents an overview of avalanche risk management planning and operational guidance for the course leader, instructor, and provider's application of best practices.

Accompanying this document is the AIARE Operational Avalanche Risk Management Plan (OARMP) version 2022. The plan is shared with providers as an example or template.

This document deals with "organizational" risk management. The OAMP describes the risk management process and actions undertaken during a course that are necessary for effective learning in the natural environment.

The primary objectives of an AIARE avalanche course are Learning Objectives. Students enroll in an American Institute for Avalanche Research and Education (AIARE) affiliated program to learn about avalanches and to improve their skills at managing avalanche risk.

ISO 31000:2009 defined risk is as the "effect of uncertainty on objectives".<sup>1</sup> In the context of an avalanche course, uncertainty or lack of certainty, is a natural condition. Winter mountain weather, terrain, and avalanches all present a variety of natural hazards to the backcountry traveler. During the delivery of an avalanche course there is always the chance *activities will not go according to plan*. Clearly, there are risks, including snow avalanche risks, on an avalanche course.

Snow avalanche risk management on a course involves actions taken at both a planning and operational stage.

Descriptions of best practices have been aligned with ISO31000 and disseminated through publication by the Canadian Avalanche Association of the *Technical Aspects of Snow Avalanche Risk Management (TASARM)* in 2016.

## Planning

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Planning includes materials and actions that support a successful course. Materials include an Operational Avalanche Risk Management Plan and Terrain Catalog. Actions include preparation and pre-course risk communication. These are in addition to any regulatory, insurance, accounting, or human resource aspects of running a business that delivers avalanche education.

An **operational avalanche risk management plan** identifies the hazards, describes the operational procedures to assess the avalanche hazard and risk, outlines mitigation measures to address hazard and risk factors, and the steps for operational continual improvement.

A **terrain catalog** includes maps, oblique and aerial photographs, terrain statistics and descriptions for planned or regular travel routes and worksites, field resource locations (e.g. rescue caches), and mitigations measures (e.g. control

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<sup>1</sup> For background see Dr. Bruce Jamieson's overview of ISO31000 at <http://vimeo.com/78534638>

routes). The terrain utilized by an avalanche operation is cataloged at a level of detail that allows effective and efficient day to day operational avalanche risk management tasks.

**Preparatory actions and risk communications** that precede the course start adjust factors that contribute to the risk (exposure, vulnerability), and communicate uncertainties. Some examples are:

- Communicating to each student (prior to the course start date) the course location, agenda, proposed field trips, student skill level/experience/fitness and instructor expectations. Informing all stakeholders of the hazard and risk, and of the plan to manage the risk. Informing all stakeholders of the plan to work in groups, assess and discuss the risk each day prior to traveling in the terrain.
- Prior to field activity, each person signs a waiver (participant agreement) that describes the risks.

Course providers and leaders can use the following checklist to achieve best practices and reduce uncertainties that can affect a course and its delivery. The list is a baseline, is not exhaustive, and covers the points illustrated above from an operational planning perspective. Providers should feel free to add to the list but think twice before subtracting from the checklist.

1. Prior to the season:

- Course providers sign the AIARE provider agreement.
- Course providers hire and train staff.
- Instructors meet AIARE prerequisites.
- Instructors meet AIARE CE recommendations and are fit and able to provide quality avalanche education and backcountry leadership.
- Course instructional materials including AIARE field books are updated (to the current season) and stocked in adequate quantities. If applicable, student rental/sale equipment including snow observation kits and avalanche rescue equipment are stocked.
- Review or update the terrain catalog, refine and update any digital tools and data used by your organization.

2. Prior to the course:

- Students receive course logistics information in advance of the course start date. This student communication informs:
  - Where is the course? Course location, date, and meeting time.
  - What will I learn? Course goals, learning outcomes, agenda.
  - What are the risks? Copy of participant agreement/waiver.
  - How can I prepare? Pre course study and exercises; online resource links including the local avalanche forecast, incident report database, and trip reports. List of relevant maps and guidebooks that encourage terrain familiarity. List of proposed field trips. Gain familiarity with mobile digital mapping or navigation tools that will be used in the course
  - What is involved? Local logistics, time expectations, physical requirement.
  - What do I bring? Required and recommended equipment list.
  - Where can I get more information? Course Leader contact info
- Venue preparation:
  - Locate meeting room to provide quick access to the backcountry and reduces student time stress. Reserve teaching aids prior to course including audiovisual projector/screen, Internet access, tables, chairs, and white boards. Ample space for group breakout sessions and class materials is provided.
  - Print student course manuals and handouts. Request and receive AIARE field books.
  - Instructors preview field terrain.
  - Include in terrain catalog digital terrain photos for each day's field trips. Include both overview and close

up terrain images for hazard and risk discussions in the class.

- ❑ Instructor preparation:
  - Instructors attend a pre-course meeting: review agenda, lesson assignments, proposed field trips/terrain use, student resumes etc.
  - Instructors review seasonal and current snowpack conditions, and discuss instability/hazard trends. Discuss and identify problem terrain and modify agenda as required. Identify and discuss natural decision-making points in the terrain to facilitate student-group terrain decisions.
  - Review the emergency plan:
    - Inspect group gear and personal protective equipment.
    - Decide on the equipment carried by each instructor on each field trip.
    - Review and update emergency numbers/protocols. Identify available rescue resources.
    - Review field communication plan: cell, &/or VHF/UHF radio, &/or satellite phone use.
    - Provide incident/accident report forms to instructors.
  - Identify the daily weather and snowpack data source provided to students for the trip plan. Include local and remote stations, local area snow reports, recent trip reports, and public avalanche forecast.

### Monitoring & Review

A principle of risk management is the facilitation of continual improvement and enhancement of the organization. The steps below are typical ways this is embedded in an avalanche operation.

- Ensure a notable event reporting culture. Learn from past events, close calls and/or accidents. Provide an open environment for discussion of these events with no repercussions. Discuss in an open, honest manner that promotes learning.
- Schedule preseason employee training; and continue the training throughout the year. Midseason, ask each other “are we on track”, and “what can we improve” with regards to operational risk management. Have a plan to include temporary staff as well as capture their perspectives and feedback.
- Ensure all staff can define your operation’s acceptable level of risk (operational risk band). Encourage instructors to review each day and ask themselves “where were we nearest the operational risk band boundaries” and “what could we done differently?”
- Review the season, instructor and student feedback, logistics, staffing, objectives, successes, areas for improvement.

## Operations

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Achieving specific operational goals during an avalanche course includes **avalanche hazard assessment, forecasting, and implementing field activities** following the policy and procedures outlined in the operational avalanche risk management plan. Terrain for use to deliver field lessons is selected from the terrain catalog.

Prior to the course instructors determine the general **terrain suitable for each day’s learning objectives**. Also, prior to the course instructors identify terrain most likely to avoid given seasonal and recent trends (what terrain is historically problematic for the type of scenario we are embarking on). Terrain identification of where the avalanche hazard is present continues in the field at a smaller scale through direct observations of current or recent activity and other key factors.

The current and near-term avalanche hazard for the intended location for the day's field trip is assessed as described in the operational avalanche risk management plan. Best practices follow the Conceptual Model of Avalanche Hazard and a forecast is made rating the likelihood of avalanches, their expected behavior and destructive size. Following an avalanche hazard and risk assessment workflow helps to alleviate the chance that steps and information are overlooked.

Based on the forecast hazard, a field trip plan is developed by the instructor team to optimize learning objectives and treat the risk. Modifying the likelihood of avalanches, size or the components of vulnerability, exposure, and consequence are core to mitigation measures used to treat risk. The following bullets are examples taken from AIARE Instructor training curriculum of AIARE specific course mitigation measures.

- The instructor is trained to navigate and lead the group through the terrain in any weather.
- Instructors are trained to facilitate and respond to most emergency situations that could be encountered on the course.
- Students are trained in companion rescue prior to the course (or during the first day of the course) or avalanche terrain is completely avoided.
- Instructors and students are familiar with the care and function of avalanche safety equipment that they choose to carry in the field (i.e. transceiver, probe, shovel, avalanche balloon pack, helmet, additional insulating layers etc.). Each instructor briefs students about group safety equipment carried in addition to personal equipment (i.e. communication devices, first aid kit, bivouac sack/evacuation sled etc).
- Students, with instructor coaching, complete a daily trip plan in small groups and discuss and document hazard and risk factors (including human and other factors that may influence decisions).
- Once in the field, with instructor coaching, students re-evaluate the team dynamic and the hazard and the risk factors at several locations during the day. This re-evaluation maintains situational awareness and determines whether there is new information and whether the plan is still appropriate.
- Students, with instructor coaching, discuss the potential consequence of avalanches occurring prior to traveling in or below potential avalanche terrain.

### Monitoring & Review

Post trip- the "review the day" session reflects on the day's choice of risk treatment options. Attention is directed to what was missed, trends, and new information that may affect options chosen tomorrow.

Post course – capture the important "if I were to instruct here again" experiences from instructors. Identify areas for improvement.

## Limitations and Risk Sharing

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It is important to recognize that despite organizational diligence and the instructor's continued education, training, and expertise, knowledge of avalanche hazards will never be complete. Though rare, avalanche course accidents have occurred in USA, Canada, and Europe.

Communicating to each stakeholder that everyone, regardless of experience level, has a voice (input) and is an integral part (ownership) of the plan to manage the risk.

AIARE designs avalanche course curriculum, instructor materials, and instructor training to assist with individual instructor's lesson plan and delivery. AIARE instructor training includes knowledge and examples of applying snow avalanche risk management best practices with the expectation that instructors model and instruct appropriate hazard and risk assessment on avalanche courses. AIARE does not train nor certify instructors to guide individuals through mountain terrain in winter. Furthermore, AIARE neither provides for, nor implements, the individual course provider's risk management plans. Each course provider, course leader, and instructor are expected to work together to plan for and to manage the risks inherent to avalanche courses.

## Revision History

[Version Control Guidance in AIARE Publications](#)

Date	Version	Author	Comments	Publication Notes
2022-07-13	2.0	SC	Revision of CZ original, review by legal, tech comm, staff	published