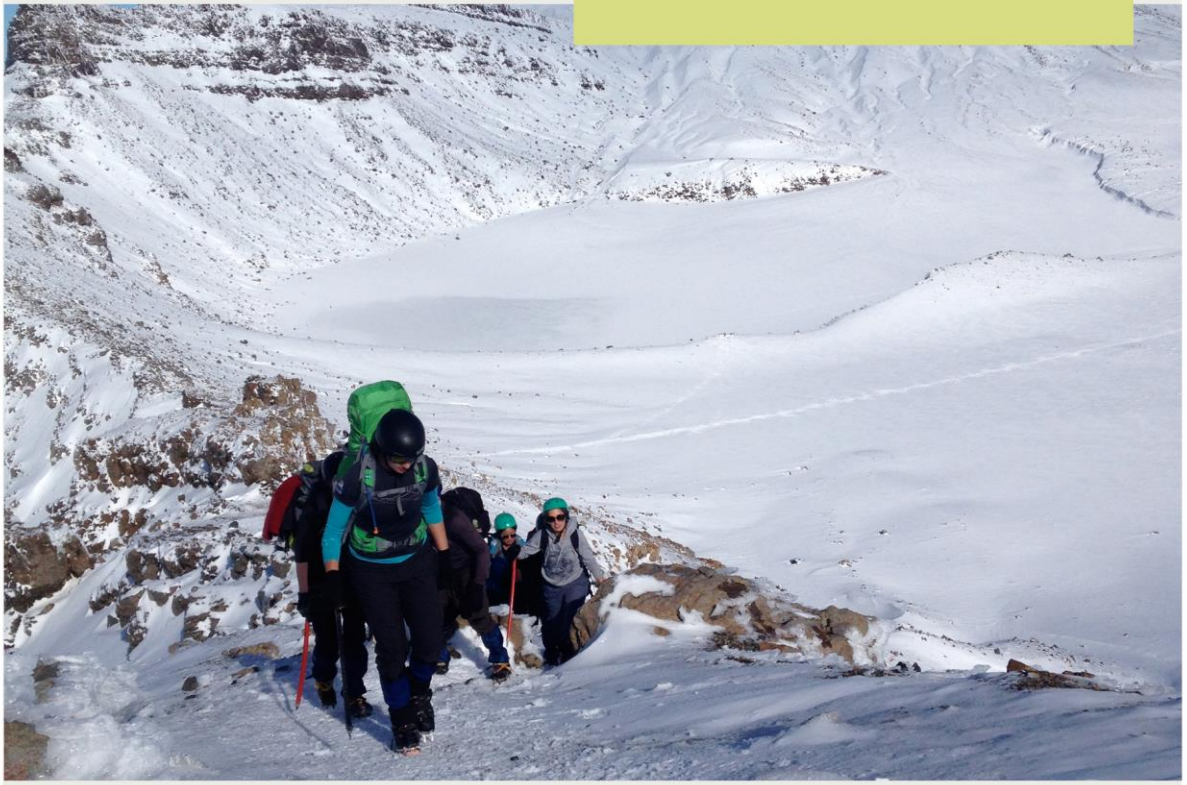
ASG

Activity Safety Guideline

Alpine Hiking



March 2016 Version 1

SupportAdventure.co.nz

SAFETY SYSTEMS DRIVEN BY SAFETY CULTURE

Preface

This Activity Safety Guideline is published by the Tourism Industry Association New Zealand (TIA) with support from WorkSafe NZ. This guideline was developed in association with experts from the alpine hiking sector and other relevant technical experts. More information about the guideline development process can be found at www.supportadventure.co.nz

The guideline is a web-based document that will be reviewed and updated as required. The current version is available at www.supportadventure.co.nz Users should periodically check the date and version number of the current online document to ensure that their printed copies are up-to-date.

Activity Safety Guidelines are the result of a recommendation from the final report of the 2009/10 government review of risk management and safety in the adventure and outdoor commercial sector in New Zealand. The wide variety of activities provided by these sectors is referred to broadly as adventure activities, and include activities provided by adventure tourism operators and outdoor education centres. More information about the government review can be found at www.supportadventure.co.nz

TIA, WorkSafe New Zealand, and the alpine hiking community have made every effort to ensure that the information in this guideline is reliable. We make no guarantee of its accuracy or completeness and do not accept any liability for any errors. We may change, add to, delete from, or otherwise amend the contents of this publication at any time without notice.

Development was managed by the Tourism Industry Association New Zealand – www.tianz.org.nz – with the support of WorkSafe New Zealand – www.business.govt.nz/worksafe

Document control

Version 1

Change	Where
Original document	Not applicable

Published

ISBN 978-0-9941265-3-5 (Online)
Version 1, March 2016

Cover photo: On the ridge from South Crater to Red Crater, Mt Tongariro. Photo: Stewart Barclay

Acknowledgements

Other publications

This guidance contains adventure tourism and outdoor commercial sector information published on the SupportAdventure website.

This guidance contains public sector information published by WorkSafe New Zealand.

Consultation

The guideline was developed in consultation with the alpine hiking sector and other relevant experts. The following people comprised the Alpine Hiking Activity Safety Guideline working group and are acknowledged for their support and advice on technical content:

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The following groups are also acknowledged for their input and support for this particular guideline or for the overall Activity Safety Guideline project:

Alpine Hiking Activity Safety Guideline support group; New Zealand Mountain Guides Association; New Zealand Mountain Safety Council; New Zealand Outdoor Instructors Association; Outdoors New Zealand; Outdoor Safety Auditors; ServiceIQ Industry Training Organisation; Tourism Industry Association New Zealand; Water Safety New Zealand.

Approaching Chancellor Dome with Mt Tasman in the background. Photo: Fox Glacier Guiding

Contents

Definitions

This guideline assumes the reader has technical knowledge of this activity and defines only those terms that may be unique to this guideline, are used in a specific way, or that would otherwise be open to interpretation.

For the purposes of this document the following definitions apply:

Avalanche terrain

Alpine terrain that, in the presence of an unstable snowpack, has the potential to be either an avalanche start zone, in the path of an avalanche, or the run out area of an avalanche. This can be part of a controlled and managed environment such as a snow sports area or uncontrolled backcountry.

Competent person (at a specific task)

A person who can correctly perform the task. They have usually acquired the knowledge and skills to do this through a combination of training, qualification, and experience.

Direct supervision

When the person supervising is in a position to be able to physically intervene and manage anticipated hazards.

Edge

The place over which a person could fall if they are not attached to a safety system.

Good practice

The range of actions currently accepted within the adventure and outdoor sector to manage the risk of harm to staff, participants, and visitors.

Guide

A term for all guides, instructors, assistants, trainees, coaches, and leaders in an alpine environment who have assumed a formal duty of care for activity participants, irrespective of whether they are paid or volunteering.

Health and safety terms

See the Appendix for an explanation of the terms *all practicable steps, serious harm, hazard,* and *significant hazard*

Incident

An event that could have caused or caused harm to any person.

Indirect supervision

When the person supervising is able to communicate with the person being supervised, but may not be able to physically intervene to manage hazards should they develop. There are two types of indirect supervision – proactive and reactive:

- Proactive indirect supervision is where the supervising staff member is actively monitoring the participant and is in a position to provide verbal assistance to intervene and manage hazards should they develop
- Reactive indirect supervision is where the supervising staff member is in a position to communicate verbally and provide assistance to a participant when sought, but may not be actively monitoring the participant or provide pre-emptive assistance.

Non-technical terrain

Alpine and sub-alpine terrain where it is possible to travel by walking. This is terrain in which a guide would not intend to use a rope other than as a hand line for confidence purposes. This excludes terrain that, due to its steep nature and/or the consequence of a slip or fall, may require the use of a rope and appropriate anchors for multiple pitches to maintain an acceptable level of risk. Also excluded is rock climbing, ice climbing, mixed climbing, roped glacier travel, and mountaineering.

Operator

Person or other legal entity (whether an employer, principal or self-employed person) that provides an adventure activity to a participant.

Participant

A person who takes an active role in an adventure activity but is not in a leadership or supervisory role.

Qualified

A person who holds a current, nationally recognised qualification.

Risk

Effect of uncertainty on objectives.

Risk assessment

A process undertaken by a competent person to identify risks and assess the risks according to their significance – potential severity of impact and probability of occurrence.

Safety critical task

A task which if performed incorrectly or not performed at all will likely lead to an incident.

Safety management plan (SMP)

The written plan outlining the systems an operator will use to manage safety.

Safety management system (SMS)

The overarching management system for directing and controlling an operation in regard to safety.

Sector

New Zealand adventure tourism and outdoor education providers, support organisations, and associations. A specific part of the sector may be referenced, e.g. the alpine hiking sector.

Situational awareness

The ability of a guide to identify, monitor, and make decisions on a range of factors throughout an activity.

Staff

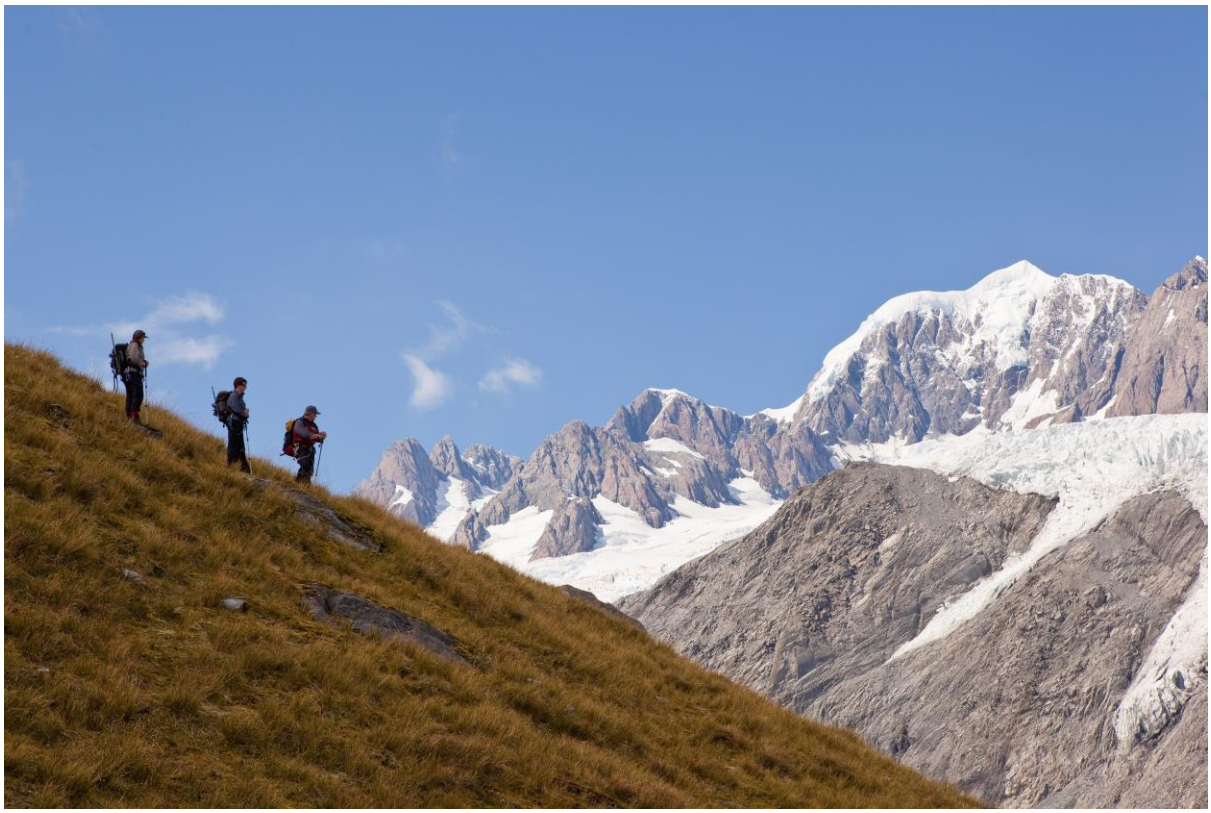
Employees, contractors or volunteers who work for an operator as instructors or guides and are responsible for the safety of participants undertaking low alpine activities, e.g. participant screening, guiding, and supervising participants.

Standard operating procedures (SOPs)

Written information outlining how an operator plans to conduct a particular activity or task.

Technical expert

A person who has professional credentials such as a high level nationally recognised qualification, or extensive knowledge, skills, and experience. They advise auditors and operator on technical tasks, including activity practices.



Descending to Chancellor Hut. Photo: Fox Glacier Guiding

Section 1: Introduction

This is an Activity Safety Guideline for alpine hiking. It is made up of two main parts.

In the first part you will find:

- a description of the New Zealand alpine hiking sector
- an introduction to the legislative context for alpine hiking activities in New Zealand
- an explanation of the purpose of this guideline and how it relates to the laws around health and safety
- an explanation of the scope and application of this guideline: what it covers, and how to use it to build your standard operational procedures and pass safety audits
- an outline of industry good practice for establishing your hazard management process.

The second part includes sections 2 through 10, which provide alpine hiking specific safety recommendations, and section 11 that gives recommendations about reviewing your safety systems.

1.1 The alpine hiking sector

Alpine hiking activities occur predominately in tourism operations, commercial providers of outdoor education programmes, and the training of recreational users. Operations vary widely in terms of the terrain, the style of activity, the length of activity, and the activities offered.

The majority of alpine hiking operators are providing guided activities in a range of alpine and sub-alpine environments.

The alpine hiking sector is connected with the New Zealand Mountain Guides Association (NZMGA), New Zealand Outdoor Instructors Association (NZOIA), and the Mountain Safety Council (MSC).

MSC, NZMGA, and other organisations developed the New Zealand Avalanche Safety Information Exchange (Info-Ex). This service provides avalanche information for both professional and recreational backcountry users.

Terms used

The guideline scope includes alpine and sub-alpine hiking (or trekking) trips, snow shoeing trips, instructional sessions, snow shelters overnights, and camping. For the purposes of this guideline, these various trips and activities are usually described as an activity.

Note: The alpine hiking sector excludes technical mountaineering, ice climbing, rock climbing, mixed climbing, roped glacier travel, ski touring, and heli-skiing.

For the purposes of this guideline, the guide leading the activity is referred to as a guide, although they may be an instructor or an educator, an assistant or a trainee. They have assumed a formal duty of care for activity participants, irrespective of whether they are paid or they are volunteering.

1.2 The legislation

Commercial alpine hiking operations, as with all workplaces, are subject to the Health and Safety in Employment Act 1992 (the Act).

The Health and Safety in Employment (Adventure Activities) Regulations 2011 (the Adventure Activities Regulations) may also apply to commercial alpine hiking operations.

The health and safety legislation uses both *operators* and *providers* to refer to people or organisations who provide activities such as alpine hiking. This guideline uses *operators* throughout.

The Adventure Activities Regulations

Alpine hiking may expose the participant to risks as defined in the Adventure Activities Regulations. The Regulations cover activities where:

- the recreational or educational experience the participants have is the main purpose; and
- the participants are guided, taught or otherwise assisted to participate in the activities; and
- the design of the activities deliberately exposes the participants to a risk of serious harm that must be managed by the operator of the activity; and
- the failure of the operator's management systems (such as failure of operational procedures or failure to provide reliable equipment) is likely to result in serious harm to participants, or participants are deliberately exposed to dangerous terrain or dangerous waters.

The regulations require operations providing these activities to be registered and undergo an external safety audit.

For more information, go to the SupportAdventure website:
www.supportadventure.co.nz/adventure-activities-regulations

Commercial alpine hiking operations may require land use concessions or landowner permission. Operators should ensure that the correct permits, concessions, and permissions are in place, and that they abide by their conditions.

1.3 Purpose of this ASG & the SupportAdventure website

This Alpine Hiking Activity Safety Guideline (the guideline) provides guidance for commercial alpine hiking operators (primary audience) and also for safety auditors (secondary audience) as a benchmark for current good practice. It will also be useful for:

- activities that involve similar hazards, risks and techniques — such as taking groups to remote back country areas or on remote multi-day, low altitude treks
- organisations such as schools and clubs providing non-commercial activities.

The SupportAdventure website provides guidance for adventure activity operators on developing good practice safety management systems. It includes information and examples for developing a safety management plan.

This guideline and the SupportAdventure website act as companions to the health and safety legislation. They are not part of the health and safety legislation, but following their recommendations will help operators meet legal requirements to take all practicable steps to identify and manage hazards.

An investigation into an accident may look at how well an operator followed this guideline. Hazards can be identified and managed by following this guideline directly, or in other ways that achieve the same level of safety (or better). Before departing from the recommendations provided here, seek advice from a technical expert or other competent person. An operator will need to be able to justify why they use a different method from the guideline.

The responsibility for making safe decisions remains with the operator.

1.4 What this guideline covers and how to use it

The guideline describes what alpine hiking operators and technical experts consider is good practice for actively managing safety when providing commercial alpine hiking in New Zealand.

It includes all non-technical alpine activities[1] that take place in alpine and sub-alpine environments. Snow cover can be permanent or seasonal.

Activities such as driving are outside the scope of this guideline. Operators who provide these activities need to manage the associated hazards.

This guideline focuses on preventing death or other serious harm. It identifies common significant hazards that participants and staff may be exposed to during alpine hiking trips, and makes recommendations for managing these hazards.

> 'Safety Management Systems are made of a safety management plan underpinned and driven by a positive safety culture.
>
> For information on building a safety management system, go to: www.SupportAdventure.co.nz

1.5 Use this guideline to build safety

Operators need to have a safety management plan and standard operating procedures (SOPs) for each activity.

This guideline provides good practice safety recommendations to help you develop your SOPs. Many of the section titles in this guideline will correspond with headings in your SOPs document. However, it is important to consider all the recommendations in this guideline as you develop your SOPs. A significant hazard is often managed by a number of different strategies and, like your SOPs, using a section of this guideline in isolation could lead to missing important safety recommendations.

When developing your SOPs conduct activity, route and site specific hazard assessment, consider the recommendations in this guideline and add the relevant procedures to your SOPs. Note that where this guideline gives examples they are not exhaustive — think of other examples that could apply to your specific activity.

It is essential that guides conduct ongoing dynamic hazard assessment and management during the activity.

1.6 Use this guideline to help you pass safety audits

The Adventure Activities Regulations may require alpine hiking operators to obtain and pass independent safety audits.

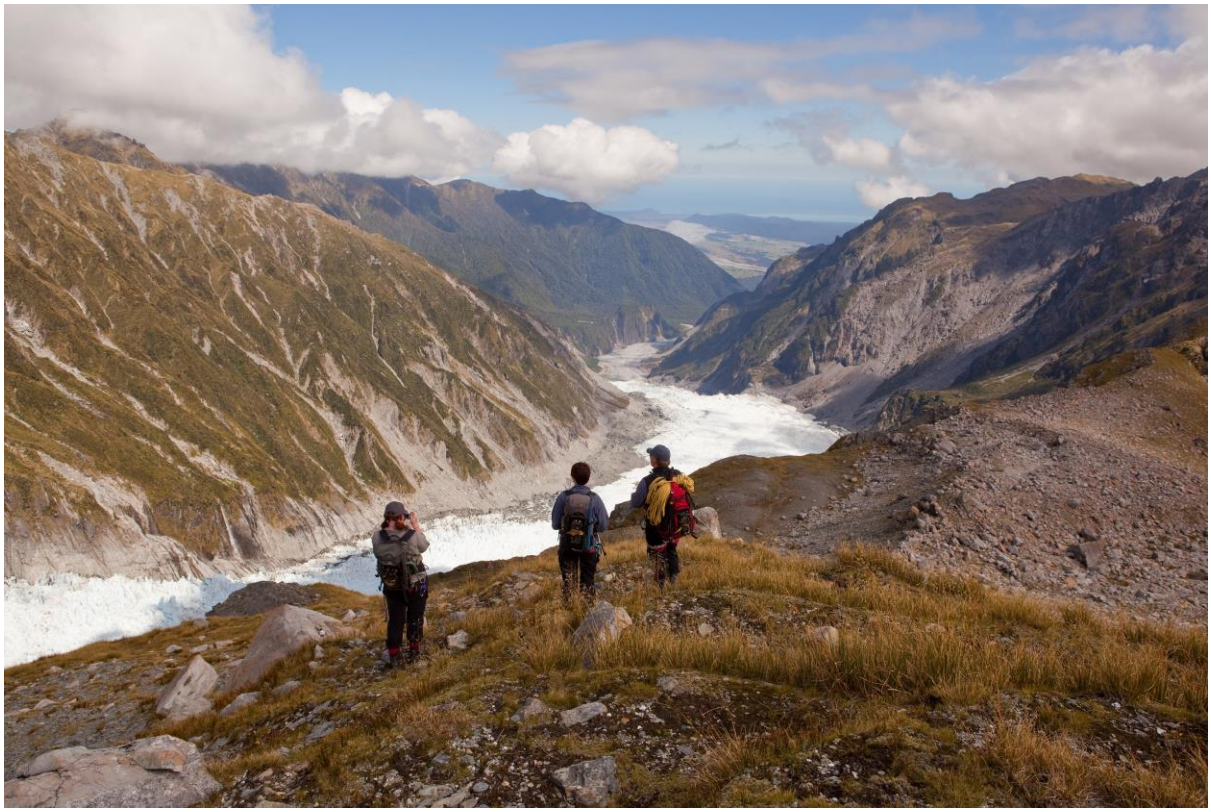
Safety audit standards specify the standards or requirements that adventure activity operators must comply with to reduce risks when providing adventure activities. Safety audit standards will specify:

[1] Alpine and sub-alpine walking, trekking, instruction, snow shoeing, snow shelters, and camping. This excludes technical mountaineering, ice climbing, rock climbing, mixed climbing, roped glacier travel, ski touring, and heli-skiing. Alpine hiking may include technical activities such as abseils and via ferrata style rope work that are outside the scope of this guideline – for information on good practice for these activities, see the relevant activity safety guidelines on www.supportadventure.co.nz

- the general standards and requirements for all operators
- that an operator's SOPs must conform to good practice for the activity.

This guideline sets out recommended good practice for alpine hiking. The guideline will help operators and safety auditors assess whether an operator is complying with good practice.

To view the Adventure Activities Regulations' Safety Audit Standard, see: www.business.govt.nz/healthandsafetygroup/information-guidance/all-guidance-items/safety-audit-standard-for-adventure-activities-2013-requirements-for-a-safety-audit-of-operators-march-2013



Looking down the Fox Glacier. Photo: Fox Glacier Guiding

Section 2: Hazard Management Process

This section looks at the following steps in the hazard management process:

- identifying and assessing hazards
- managing hazards
- managing the hazard of drugs and alcohol
- hazards most likely to cause serious harm
- using competent persons
- incident reporting and learning.

The hazard management process is a key part of an overall safety management plan. The steps involved enable hazard management to be built into standard operating procedures (SOPs).

Hazard management processes need to be driven by a positive safety culture. Apply hazard management processes to all operational situations including new activities, dynamic hazards and when there are changes to equipment.

Hazard management involves both a scheduled and dynamic approach to identify, assess, manage, communicate, and record hazards in every part of an operation.

2.1 Identifying and assessing hazards

Identify significant hazards both systematically and dynamically. Use a variety of methods to systematically identify hazards, such as:

- inspecting sites physically
- studying maps and photographs
- consulting with other industry operators and non-commercial users
- reviewing standard operating procedures
- reviewing past incident reports and lessons learned
- using the Backcountry Avalanche Advisory www.avalanche.net.nz
- reviewing past hazard information, such as snowpack data, and looking for trends.

Assess all hazards to identify which ones are significant. Align assessment and rating systems with current good practice and take into account the nature and context of the activity.

2.2 Managing hazards

Manage hazards according to the ‘eliminate, isolate, minimise’ hierarchy of action. Due to the inherent risk of alpine hiking activities, some hazards cannot be eliminated or isolated, and can only be minimised.

Hazard management should reduce the risk of harm to acceptable levels. What these acceptable levels are will depend on the nature and context of the activity, participant ability, and on current good practice.

Dynamic hazard management

Managing hazards includes monitoring them for changes in their significance. A higher level of management — such as moving from minimising to eliminating — may be necessary if a hazard increases in its likelihood to cause serious harm. For example, an unfavourable weather forecast may mean that an activity or should not take place or should be modified. Ensure your SOPs contain the relevant dynamic hazard management strategies.

2.3 Managing the drugs and alcohol hazard

The Adventure Activity Regulations explicitly require operators to manage the drug and alcohol-related risks in their workplaces, starting with a clear drugs and alcohol policy in their safety management plan. Auditors will expect to see a policy suited to the risk within the operator's workplace, and evidence that it is being implemented.

To see the WorkSafe guidance document on managing drugs and alcohol-related risk in adventure activities, go to:

www.business.govt.nz/healthandsafetygroup/information-guidance/all-guidance-items/guidance-for-managing-drug-and-alcohol-related-risks-in-adventure-activities

2.4 Hazards most likely to cause serious harm

This guideline focuses on preventing death or other serious harm. While all significant hazards need to be managed, it is acknowledged that there are some that are more likely to be associated with serious harm than others. Ensure safety management strategies are focused on managing these hazards. This includes highlighting them in staff meetings and regular hazard management reviews.

Alpine hiking can be high risk, depending on the weather conditions, terrain and remoteness of the activity. Pre-activity planning, terrain assessment, site assessment, thorough profiling of the participants, being adequately equipped, staff competence, dynamic hazard management and situational awareness are critical components of good practice.

The most likely causes of serious harm are impact injuries from falling, sliding or slipping, avalanches, external impact, drowning, and hypothermia. The hazards considered most likely to contribute to these are:

- unsuitable environmental conditions, e.g. weather or snowpack
- unsuitable participants – fitness, skills, staff/participant ratios and pre-existing medical conditions
- unsuitable route selection – terrain hazards, too long, too technical or too exposed
- unsuitable site choice for an activity or shelter
- poor guiding decisions, group management, pace setting, situation awareness, supervision and/or lack of knowledge for the track, route or site
- unsuitable staff
- not being suitably equipped for the terrain, environmental conditions and emergency situations.

Good practice for managing each of these hazards involves a number of different strategies. When developing your SOPs, ensure you consider all the relevant recommendations in this guideline –

using a section of this guideline in isolation could lead to missing important safety recommendations.

2.5 Using competent persons

Use suitably competent people to identify, assess, and manage hazards. For more information on staff competence, see Section 6.

Ensure the competent person is familiar with the operator's safety management system, participant market, relevant site-specific information, and has access to historical information on site hazards and incidents.

2.6 Incident reporting and learning

Report, record, and analyse all incidents and concerns that affect safety or have the potential to affect safety. This is done to enable learning and to help stop the incident happening again. Act on anything you learn.

Incident reporting systems need to be used effectively. Induction and ongoing training are vital, but are only a part of ensuring that this happens. The system must be openly and regularly used, particularly by senior staff, to have any chance of success.

To encourage responsible reporting, take care to think of reporting and recording separately from the incidents themselves. Avoid penalising people for reporting incidents. Good reporting and recording should be seen as positive behaviour irrespective of whatever faults may have led to an incident.

For more information on hazard management processes, go to:
www.supportadventure.co.nz/safety-management-plans/hazards

For more information on incident reporting, go to:
www.supportadventure.co.nz/safety-management-plans/incidents

Section 3: The Environment

There are particular factors of the alpine hiking environment that are associated with serious harm. This section identifies good practice hazard management strategies for dealing with these factors:

- remoteness
- terrain
- natural events
- hazards from other users
- allergic reactions
- protecting the environment.

The information in this section should not be considered all-inclusive. It is essential to carry out operational, route, and site-specific hazard management processes. Furthermore, ensure that all guides are required to conduct ongoing dynamic hazard identification, assessment, and management throughout the activity.

3.1 Remoteness

Any element of poor planning and being poorly equipped can be exacerbated in a remote alpine or sub-alpine environment. Robust activity planning and activity management are essential.

Planning

You should:

- Estimate activity travel times, considering distance, elevation gain/loss, daylight hours, group size, participant profiles, staff/participant ratios, supervision levels, navigation complexity, terrain analysis, snow conditions, river levels, and weather
- Identify safe zones and contingency routes
- Ensure all participants have the required clothing, equipment, and any essential personal medication
- Ensure that the activity is suitable for the group and each individual
- Ensure that all participants have disclosed safety critical information
- Ensure that full disclosure of the risks and their roles and responsibilities has been communicated to the participants
- Ensure that all equipment is fit for purpose.

Getting assistance in emergency situations

Limited access, weather, and/or communication options can make emergency evacuation difficult and lead to lengthy waits for external emergency support. Identify and assess the:

- degree of remoteness
- complexity, severity, and scale of incidents – including the sudden onset of illness at any stage or time of the activity
- communication options
- emergency equipment and staff competencies required
- whether emergency services will be immediately available.

Operating procedures

Ensure that sufficient equipment is available to manage group safety during a delay in accessing assistance — sufficient first aid supplies, emergency shelter, two-way communications, insulation mats, torches, heat sources, and food.

Be prepared for an unplanned night out or the use of an emergency shelter. Cache emergency equipment if practical. Consider that emergency services may not be immediately available.

Map the emergency shelters, communication options, and helicopter evacuation sites. Consider including the aircraft operators in planning and training for emergency scenarios.

Staff

Staff must have an appropriate and current first aid qualification.

Ensure staff are prepared and trained for a range of emergency situations.

Activity management

You should:

- Ensure that all planning, operational, and equipment maintenance checks are completed.
- Set up daily procedures for planning and checks during multi-day trips
- Ensure on multi-day trips that you can access up-to-date weather forecasts, river flows, and avalanche forecasts if applicable
- Brief participants on specific safety hazards and procedures, including any role they may have to play in an emergency.
- Maintain situational awareness with respect to terrain conditions, weather, location, speed of travel and the time of day. If terrain conditions or weather are not what was expected or are forecast to change, consider modifying or cancelling the activity. Ensure you can access to up-to-date information and forecasts.
- Be prepared to share the route, instructional sites, hut and campsites with other users, and consider the impact they could have on your activity from a safety perspective.

Participant and group management

Participants know how to activate an emergency call out if the activity professional cannot do that for any reason.

Disclose to the participants that medical services may take time or be delayed due to adverse conditions.

Medical conditions

Record all pre-existing health issues and ensure all necessary medications are available at any time of the activity. This may require diligent management in larger groups or when a group is using more than one guide.

3.2 Terrain

Scope: alpine and sub-alpine tracks, routes, instructional sites, shelters, and campsites

Terrain hazards

Identify and assess the type of terrain where the activity will take place.

Hazard management strategies should be based on the associated risk. Options include:

- analyse the terrain for hazards such as avalanche terrain or river crossings
- use terrain that is within the group's ability – does it match their expectations, experience and fitness as a group and as individuals?
- ensure activity planning identifies how the terrain could change during the activity
- guides dynamically identify and assess terrain hazards throughout the activity – situational awareness
- if terrain conditions (and/or weather) are worse than planned for, consider alternative routes or objectives
- identify and map no go zones, safe zones and contingency routes and sites
- network any recent changes.

Changes to the hazards of terrain

Significant events such as earthquakes, volcanic activity, avalanches, slips, floods, tree or rock fall may affect known existing hazards or create new hazards.

Ensure that systems are in place to check and maintain tracks or otherwise manage hazards after environmental events that could have changed or created hazards. Ensure that DOC, land owners, managers or other people who may be aware of hazards on the activity know of the importance of communicating relevant hazard information to the operator and have the information they need to do so, such as telephone numbers.

Record any changes to hazards, identify those that are significant, and notify relevant staff and other users of the area.

The risk of sliding or falling in dangerous terrain

Scope: walking, trekking, instructional activities, sites, traversing, boulder hopping (rivers and routes), steep slopes, and ridges

Identify and assess all terrain for the likelihood of participants sliding or falling. This also applies to intentional sliding and falling during instructional sessions, such as self-arrest training.

Factors to consider when identifying hazards are:

- Are they likely to fall, given terrain conditions, their footwear, and their ability?
- Is the slide or fall likely to cause harm, given hazards like rocks, bluffs or hitting others?
- Are the conditions likely to change and increase the risk, such as an overnight freeze?

Ensure that guides are also protected from sliding or falling.

The concept that no controls are needed where a person faces a 3-metre fall or less is incorrect. Manage the risk of falling any time a person could be injured if they slide or fall.

Hazard management strategies should be based on the associated risk.

Operating procedures

You should:

- select routes and sites that eliminate or minimise the likelihood and/or the consequences of hazards
- assess the run out for hazards
- wear helmets when appropriate

- select appropriate poles, snow shoes, ice axes, and crampons
- ensure spacing and positioning of the participants so they don't slide or fall into each other
- consider using safe spotting techniques for the participant and guide
- consider using hand lines for confidence
- consider cutting steps
- consider modifying the ratios, supervision levels, and positioning of the group
- require guides to constantly identify and manage hazards.

Group management

Manage general exposure to the risk of sliding or falling by:

- Preparing participants carefully through a skills progression.
- Reminding participants of the risks when the hazard appears.
- Ensuring that people stay far enough away from edges to minimise the risk. This will often include establishing safe zones back from an edge and communicating these clearly to participants.
- Spacing participants at distances that ensure they will not cause each other to fall and, if someone falls, they will not land on another participant.
- Ensure that participants' supervision levels and strategies are in line with their needs. Factors to consider are the participants' fitness, agility, confidence, experience, fatigue, as well as the time of the day.
- Using abseils, via ferrata, and technical mountaineering skills if necessary. Managing the risks associated with these activities are covered by other activity safety guidelines such as Abseil and High Wire and Swing.

Note: Technical mountaineering skills are out of the scope of this guideline.

Avalanche danger

Avalanches are one of the most likely sources of serious harm incidents involving multiple persons.

Some operations will choose to use a ski field to run their activities. They must ensure that they have daily and regular access to reports of conditions for the areas they are using, throughout the duration of the activity.

All operators should have, as part of their SOP, an Avalanche Hazard Management Plan that is specific to their operation and includes the following:

- A review of the general area of operation identifying the probability of an avalanche hazard based on how often the environment has enough snow on the ground for it to be at threshold (6-12 months per year, 3-6 months per year, 1-3 months per year, 1-4 weeks per year, every few years).
- A process for attaining an avalanche stability/danger forecast suitable for staff qualifications, training, and accessing outside resources (Info-Ex avalanche.net.nz or support from a local snow sports area).

Identify any probable avalanche terrain used. This may be classified into avalanche paths, and/or consequence zones, e.g. Avalanche Terrain Exposure Scale or safe spots. This may also include alternate routes using non-avalanche terrain

List the resources that will be required by staff and participants, available on the mountain (cached in hut or vehicle), and stored at a base area.

Describe the minimum levels of experience, training and qualification required by both the AP, operations staff and the activity participants

The Avalanche Hazard Management Plan should be externally endorsed by an Avalanche Safety Management Stage 2 practitioner or another appropriate person.

Rock fall and other falling objects

Identify and assess for the likelihood that participants could also be exposed to rock fall, sliding and falling hazards. Reducing this exposure to acceptable levels relies heavily on robust activity management systems and competent staff.

Factors to consider are:

- unstable scree and terrain traps like gullies and moraine walls
- participants dislodging rocks onto others
- other user groups dislodging objects
- the effects of recent heavy rain, high winds or ice.

Hazard management strategies should be based on the associated risk. Options include:

- selecting and adjusting routes to eliminate or minimise hazards
- avoiding terrain that collects and channels loose rock
- monitoring for evidence of previous rock fall
- adjusting the supervision levels
- instructing participants on how to move and minimise dislodging rocks
- using traversing lines on ascent – descend on individual fall lines
- avoiding climbing under others
- stabilising or removing loose rocks when possible
- wearing helmets
- using safe zones
- monitoring other user groups in the area

Situational awareness is about constantly monitoring, supervising, and managing.

River crossing

Access to alpine hiking environments can often include river crossing. If the water is too high or swift, people can be exposed to the risk of drowning or injuries. Other consequences can be hypothermia, group separation, losing equipment, and being stranded.

Consider whether you really need to cross.

Refer to river crossing in Section 4.3.

3.3 Natural events

Alpine hiking can be exposed to the effects of weather events such as high winds, heavy rain, and lightning. Natural events can be volcanic activity or earthquakes that can create rock fall, gas clouds, and landslides.

Hazard management options include:

- identifying and assessing the risk of hazardous weather and other natural events
- ensuring that pre-activity procedures include checking that conditions are suitable
- ensuring guides know and use the best available methods for predicting mountain conditions such as forecasting services and local indicators
- two-way communications to access the latest forecasts and reports throughout the activity
- using local no-go indicators and procedures for cancelling due to concerns about conditions
- establishing procedures for when alpine conditions change, such as safe waiting areas, emergency supplies, escape routes and evacuation
- establishing a range of support and emergency procedures
- briefing the participants on their roles and responsibilities.

The effects of environmental extremes

Scope: hypothermia, cold injuries, snow blindness, dehydration, severe sunburn, and heat stroke/hyperthermia

Strategies for managing environmental extremes should be based on the associated risk. Options include:

- managing the start times and duration of trips and activities to suit the environmental conditions
- ensuring that participants are equipped with correct layers of clothing
- ensuring guides' competencies include prevention strategies and management and knowledge about clothing layering
- ensuring participants are regularly rehydrating and eating
- carrying extra thermal clothing, emergency shelter, insulation mats, food, water, and heat sources
- minimising the time participants are exposed to cold or heat while waiting their turn at the activity, such as using a shelter or running other activities.

The risk of limited visibility

Factors to consider are:

- getting lost
- group separation
- terrain hazards such as edges or bluffs
- slowing down the pace of the activity – possibly resulting in a night out
- no helicopter access if required for an emergency.

Strategies for managing include:

- ensuring guides are familiar with the terrain and hazards
- ensuring guides are competent navigators and are equipped with the relevant references and equipment
- keeping the group together
- ensuring that guides continuously monitor weather, dynamic hazards, time management, pacing, participants' ability, and fatigue

- ensuring that the group is self-sufficient and can spend a night out or deal with delayed help in an emergency.

3.4 Hazards from other users

Other users can create rock fall, avalanches and other hazards. You should:

- notify and coordinate with all other known users of the area
- monitor other groups in the area
- contingency plan around the limitations resulting from other users, such as the loss of a camping site, hut, snow shelters, or instructional site.

Note: In snow sport areas, ensure your activities are in approved areas and that your presence is known – even after hours – so that snowmobiles and groomers are aware of you.

3.5 Allergic reactions

Scope: food, medication, and bee and wasp stings.

Access to tracks, routes and sites can often include environments suited to bees and wasps. Participants may also be allergic to other substances.

Strategies for managing should be based on the associated level of risk. Options include:

- screening participants for any known allergies
- carrying epi-pens or adrenalin and training guides in their use
- ensuring that, if participants know they are allergic, they are carrying their medication.

Note: Not all participants know their allergies, so be prepared.

Bees and wasps

You should:

- avoid disturbing hives
- consider placing those who are allergic at the front of the group
- consider doing a thorough check on conditions with DOC, landowners, or other users before entering an area.

3.6 Protecting the environment

Alpine and sub-alpine environments are often wild and unspoilt areas but this is a fragile state. Professional operators set the tone for environmental protection.

It is critical that operators and their participants carefully follow the environmental care code at all times. Don’t accept anything else from staff or participants.

Section 4: Alpine Hiking Activities

This section looks at the primary alpine hiking activities in non-technical terrain. It identifies significant hazards and good practice for managing those hazards. The activities are:

- walking
- site management
- river crossing
- helicopter transport.

The information in this section should not be considered all-inclusive. Use it in conjunction with the recommendations in the rest of this guideline. It is essential to carry out site and activity specific hazard management processes, and for guides to conduct ongoing dynamic hazard identification, assessment, and management.

4.1 Walking

Scope: the use of walking poles, snowshoes, ice axes, and crampons in non-technical alpine and sub-alpine terrain.

Factors to consider when identifying and assessing hazards are:

- is the terrain within the group's ability – does it match their expectations, experience, and fitness as a group and as individuals?
- is the clothing and equipment appropriate and fit for purpose and the expected conditions?
- does the equipment fit correctly and safely?
- are the guides competent for this activity, with these participants, and in these conditions?
- are the supervision ratios appropriate for this activity and the needs of the group?
- have the participants been informed about the risks and have they acknowledged them?
- do the participants understand their safety requirements during the activity?
- have the participants disclosed medical and safety critical information?
- where and how could the group separate and/or get lost?
- how is the group prepared for emergencies?

Strategies for managing should be based on the associated risk. Options include:

- ensure all the equipment is fit for purpose with thorough pre-activity checks
- check that the equipment fits correctly
- stipulate when and where to fit and instruct on the use of the gear
- run a warm-up session to test the gear and the ability of the group
- pace the activity to suit participant fitness
- set up a buddy system and designate a tail ender
- brief the group on clear no-go areas
- ensure there are clear group management strategies around toilet breaks, taking photos, or where there could be opportunities for the group to split up
- ensure the staff are competent for the requirements of the activity
- ensure the ratios and supervision levels are appropriate.

4.2 Site management

Instructional scope: snowshoes, ice axes, crampons, self-arrests, navigation exercises, avalanche awareness courses, snow shelters, and tenting.

Instructional sessions

Factors to consider when identifying and assessing hazards:

- using an unsuitable site
- not all terrain hazards have been identified, such as rocks in the run out
- participants hitting each other
- poor guiding and instructing progressions
- poor supervision levels
- participants not following instructions
- group management issues
- participants using clothing and equipment unsuited to the conditions.

Strategies for managing should be based on the associated risk. Options include:

- complete a site and terrain analysis
- ensure the staff are competent for the site and activity
- ensure the ratios and supervision levels are appropriate
- check that participants understand and are gaining confidence.

Shelters and camping

Factors to consider when identifying and assessing hazards:

- collapse of snow shelters leading to injuries, loss of shelter, and an emergency
- tents or snow shelters are inadequate for the conditions
- participants are inadequately prepared for a night out
- participants are fatigued, cold and wet, and susceptible to hypothermia
- burns from poor cooking procedures or equipment
- carbon monoxide poisoning from cooking in shelters with poor ventilation
- sliding hazard: participants have not been prepared for an overnight freeze and icy conditions in regards to, e.g. toilet trips
- the snow sports operator is unaware that you are in their area.

Strategies for managing should be based on the associated risk. Options include:

- choose the most appropriate method to make a snow shelter
- check that the participants have the necessary equipment
- check that the snow shelter is unlikely to collapse
- ensure access to emergency shelters
- set up well ventilated cooking systems
- prepare participants for icy conditions
- ensure that other groups know where you are.

4.3 River crossing

Alpine hiking environments can often include crossing rivers. If the water is too high or swift, people can be exposed to the risk of drowning, impact injuries, hypothermia, group separation, losing equipment, and being stranded. Always assess whether you really need to cross.

Factors to consider when identifying and assessing the hazards include:

- water depth, speed of water, water volume, water temperature, entry and exit points, run out, characteristics of the river bed, bends and curves in river, weather and rainfall, catchment size, strainers, foot entrapment, group size, and group experience
- the consequences of anyone in the group slipping, swimming, and/or not making the exit point
- drowning
- impact injuries
- potential for hypothermia in respect of clothing, gear and physiology
- participants' response to cold water immersion
- loss of packs and equipment
- a group member being swept away
- the group separating
- the group being stranded
- safety critical equipment being inoperable or ineffective from water damage, such as communication devices.

Strategies for managing should be based on the associated risk. Options include:

- apply Section 4 where applicable
- select a technique that is suitable for the group and site
- use 'do not cross' indicators
- mark alternative crossings on the map and in the SOPs
- monitor the weather and catchment areas
- ensure guides are competent in assessing and managing river crossings
- carry emergency shelters and extra group food
- ensure all safety critical equipment is protected from water damage.

Do you have to cross? Assess the group, conditions and time of day and be prepared for an unplanned night out or use of emergency shelter if you can't cross.

4.4 Helicopter transport

The primary duty of care is with the helicopter company. Ensure you have clear operating procedures with them.

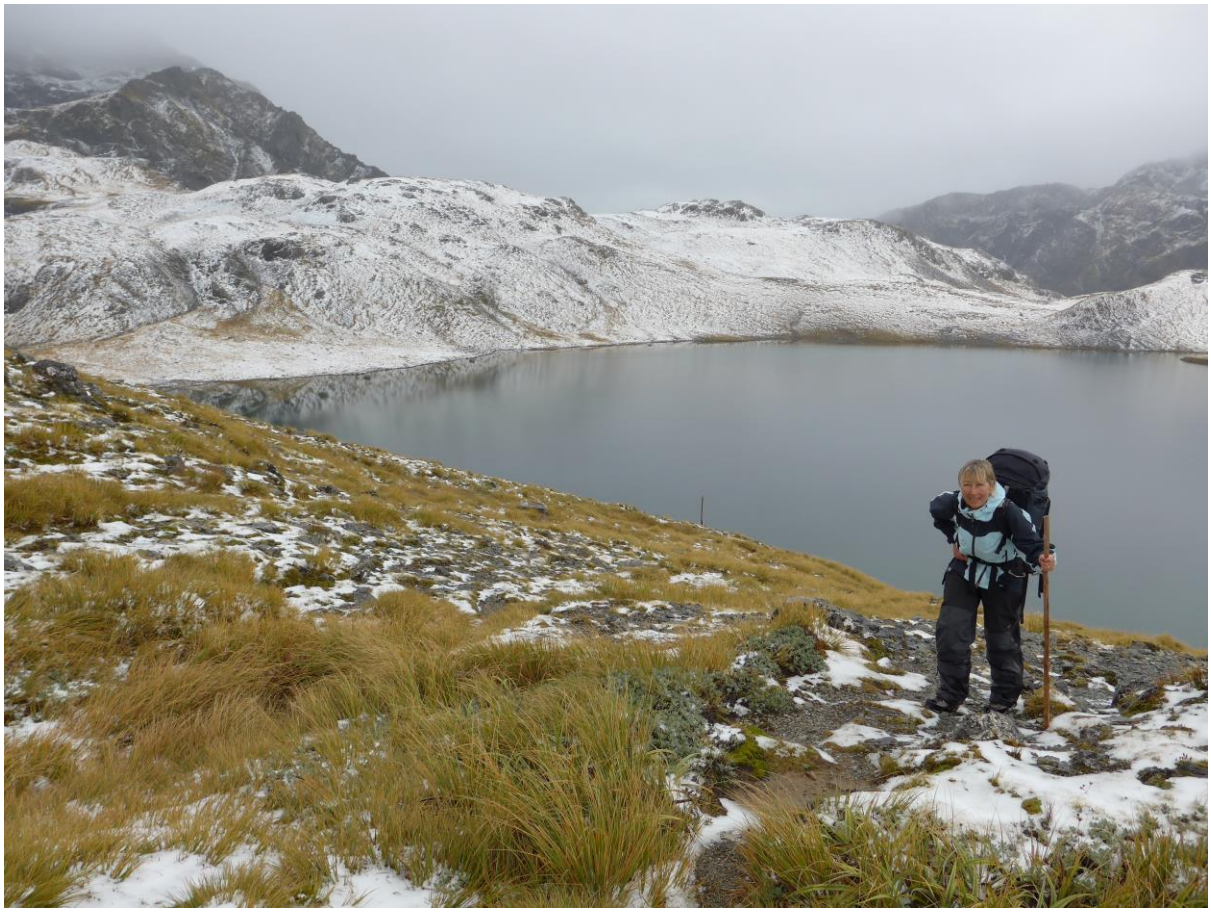
Factors to consider when identifying and assessing hazards include:

- rotor blades contacting people or gear
- helicopter landing triggering an avalanche
- flying debris due to rotor wash
- sliding while disembarking

- poor weather stopping the helicopter from flying and stranding people in the field.

Strategies for managing should be based on the associated risk. Options include:

- ensure that participants near the helicopter stay in designated waiting areas, ideally in the pilot's field of view both before and after landing – until the rotor blades have stopped turning or the helicopter has left
- ensure all clothing (including hats) and equipment is secured
- ensure all participants are supervised near the helicopter
- ensure participants do not operate helicopter doors or lockers
- instruct participants to take extreme care if disembarking on surfaces that involve a sliding risk.



Browning Pass, Three Passes Route. Photo: Charlie Hobbs

Section 5: Activity Management

Site and activity management includes ensuring each activity is staffed and monitored effectively, and that the most practicable communications systems are in place.

This section includes:

- Guide knowledge
- Activity monitoring
- Communication systems.

5.1 Guide knowledge

Use guides competent in the skills required to manage the activity. For more information, see Section 6.

Ensure that guides are familiar with the hazards of the site and with the operator's standard operating procedures. The amount of training this requires will vary. Factors to consider include:

- the specific hazards and associated safety management strategies of the activity, activity, and site
- the complexity of the activity
- the staff/participant ratio of the activity
- the competence of the guide.

5.2 Activity monitoring

Monitor group safety with a suitable backup person and on-site monitoring.

Backup monitoring

You must ensure that:

- there is a suitable backup person for each activity and activity
- there are control procedures in the SOPs for the roles and responsibilities of each person
- they are as contactable as practicable while the activity is underway, which may require 24-hour monitoring in some circumstances and the use of check in schedules.

Note: The backup person should not be involved in the activity.

On-site monitoring

Ensure every activity and activity site has a lead guide responsible for monitoring general site safety and ensuring the activity follows the operator's SOPs and emergency response procedures.

This person should be an experienced guide who the operator is confident will exercise good judgement under pressure.

Note: This does not remove the responsibility for each guide to manage the safety of participants.

5.3 Communication systems

Communication systems need to cover communication among those on the activity and those monitoring the activity or other external emergency support and, where relevant, among guides running the activity. Communication technology is evolving rapidly, so you should keep up-to-date with the latest options.

Communicating with external support

Ensure each site has a primary communication system, and a backup system if the primary system is likely to be compromised, e.g. getting wet or being dropped.

The primary system should be the most effective option practicable and should be two-way. Examples of communication systems include:

- a robust check in/check out or scheduled procedure
- a cellular phone
- a satellite phone
- two-way texting devices (there can be delays in sending and receiving texts)
- one-way devices such as personal locator beacons or SPOT trackers.

Where a communication device is used that relies on coverage, ensure that guides and back-up personnel are aware of coverage and non-coverage areas. Difficulty in communicating with external support can be a significant hazard when activities are run in remote areas.

Communication among guides

If guides are working together to manage safety of the same activity, ensure they can communicate easily or are managing tasks that do not require them to communicate with each other.

Section 6: Staff

Using competent staff is one of the mainstays of ensuring safety. This section looks at six key factors of staffing an operation:

- safety responsibilities and competence requirements
- verifying competence
- guide competence
- staff training
- identifying and managing unsafe staff
- using assistants.

6.1 Safety responsibilities and competence requirements

Ensure the safety responsibilities and competence requirements of each job within the operation are correctly identified. These jobs should include operations management and guide roles. When identifying a job's competencies, factors to consider include:

- levels of experience and judgement
- personal technical skills, including equipment knowledge
- risk management, group management, and leadership skills
- ability to operate in accordance with standard operating procedures
- familiarity with and understanding of the operational environment
- ability to communicate safety requirements/directions clearly to the participant
- rescue and emergency management skills including first aid.[2]

Ensure there are clearly defined roles and responsibilities among activity leaders, and among activity leaders and participants.

6.2 Verifying competence

It is the responsibility of the operator to ensure that staff are competent. This section looks at how to use qualifications to verify skills, and how to verify those skills that are not covered by qualifications.

Using qualifications

Operators should ensure they know which skills and knowledge a qualification actually measures. The operator should then check these against those required for the job. Any skills, competencies, or knowledge not covered by the qualification should be verified by other suitable means.

Establishing equivalency between qualifications

When establishing equivalency of one qualification with another (or parts of a qualification), you should contact the benchmark qualification provider and enquire as to the process they recommend.

[2] Ensure the number of staff with first aid qualifications, and the type of qualifications they hold are suitable for the likely first aid scenarios of the operation. See Section 6.3 for competence recommendations.

Qualifications currently under review

Several of the qualifications recommended in this guideline include avalanche components, which are part of the New Zealand Qualifications Authority (NZQA) Framework. Qualifications on the NZQA Framework are currently being reviewed. Any results of this review that affect the alpine hiking sector's recommendations for verifying competence will be included in this guideline as they become available. For more information on the overarching qualification review, go to www.skillsactive.org.nz

Skills not covered by qualifications

Verify competence in all safety skills required for a role. Skills not covered by nationally recognised qualifications should be measured in a way that suits the degree of safety responsibility associated with the skills.

Use a suitable person to verify competence. This person should have a qualification to do so, or be a technical expert in the skill to be verified who also understands national expectations on the standard of competence required.

Keep records of competence verification processes and results.

For more information on verifying staff competence, go to www.supportadventure.co.nz/safety-management-plans/staff

6.3 Guide competence

The alpine hiking sector involves a significant level of inherent risk, and thus relies on staff competence to manage that risk. It uses nationally recognised qualifications to verify staff competence.

This section identifies the technical safety responsibilities and competency requirements for guides. It does not address broader safety related roles such as operations management. Ensure that all the operation's safety responsible roles are identified and that staff are competent.

Competency requirements

The onus is on the operator to ensure the qualification they use for staff competency matches any terrain guidelines, exclusions, and limitations. For more information, including more detailed skill breakdowns, go to the administering organisation's website.

NZMGA qualifications

www.nzmga.org.nz

- IFMGA Mountain Guide
- NZMGA Climbing Guide
- Assistant Climbing Guide
- Alpine Trekking Guide
- Assistant Alpine Trekking Guide
- Hard Ice Guide.

NZOIA qualifications

www.nzoia.org.nz

- Alpine 1 – Instructor

- Alpine 2 – Senior Instructor
- Bush 1 – Instructor (pre-requisite for Alpine 1 and 2)
- Bush 2 – Senior Instructor.

6.4 Staff training

Regularly train all staff involved in safety and emergency procedures, including office staff and external contractors.

Use a structured training plan managed by a person competent to do so — this is often a role of the senior guide. Operators should record training to help show verification of staff competence.

Ensure training occurs at least pre-season, covers SOPs and emergency procedures, and highlights procedures that are new or have changed.

For training recommendations for emergency procedures, see section 9.

For more information on staff training, go to:
www.supportadventure.co.nz/safety-management-plans/staff

6.5 Identifying and managing unsafe staff

Do not permit a person to conduct or undertake safety related tasks if they are in such a state of impairment that they may be a hazard to themselves or to any person on the activity. Impairment could be due to alcohol, drugs, injury, fatigue, or illness.

Identify as a hazard any guide who is unable to perform safety tasks as required to fulfill the responsibilities of their role.

Management strategies should suit the significance of the risk and be outlined in the staff management aspects of the operator's safety management system. The Adventure Activities Regulations require that drug and alcohol hazards are specifically addressed through an explicit drugs and alcohol policy.

Initial hazard management for dealing with unsafe staff should include removing the person from the role requiring performance of safety tasks.

To see the WorkSafe guidance document on managing drugs and alcohol-related risk in adventure activities go to:

www.business.govt.nz/healthandsafetygroup/information-guidance/all-guidance-items/guidance-for-managing-drug-and-alcohol-related-risks-in-adventure-activities

6.6 Using assistants

An assistant is responsible for managing some tasks within the guide role, but not all. Skills required will vary depending on the tasks to be managed. Using assistants involves the risk of hazards not being managed competently — particularly when the assistant is new to managing the tasks, such as many teachers or parents.

When using assistants ensure that:

- tasks to be managed, safety responsibilities, and required skills are clearly identified and understood by the assistant and the guide
- the assistant is verified as competent in the required skills
- the assistant manages only the tasks for which they are verified as competent
- the competence of the assistant is considered when establishing participant supervision and ratio levels.

Looking at the Caroline Face of Aoraki / Mt Cook from Ball Ridge. Photo: Charlie Hobbs

Section 7: Participants

This section looks at three key aspects of managing participant safety. It considers significant hazards and identifies good practice for managing those hazards. The three aspects are:

- ensuring participants are suited to the activity
- informing participants about safety
- supervising participants.

7.1 Ensuring participants are suited to the activity

Assess participants to check that they are suited to participate in the activity. This should happen before the activity begins and be ongoing during the activity. This section looks at assessing participants, establishing age guidance, and identifying and dealing with unsafe participants.

Assessing participants

Use information gathered while assessing participants to help you decide activity options, participant supervision levels, and safety management techniques.

Clearly identify what to assess in the operator's safety management plan. Staff other than guides, such as front of house staff or vehicle drivers, may be involved in assessing participants. Ensure participant assessment is consistent across staff and reflects the requirements of the activity.

Factors to consider when assessing participants include:

- fitness and any specific physical abilities required
- psychological factors such as the ability and likelihood to follow instructions, fears, phobias, and confidence at height and river crossings
- age
- medical issues, particularly medication that must be taken, any pre-existing injuries, and the fact they will be in a remote environment with restricted access to medical resources
- any technical skills required for a particular activity.

For information on managing participants with mixed abilities, go to: www.supportadventure.co.nz/other-resources - MixedAbilities Also see the Mountain Safety Council Outdoor Safety Manual – *Risk Management for Outdoor Leaders*.

Establishing age guidance

There are no overarching age recommendations for alpine hiking in New Zealand.

Establish minimum age guidance for each alpine hiking activity. Factors to consider include:

- the terrain and duration of the activity
- the specific hazards of the site
- whether the participant fits the clothing and equipment for the activity
- the ease of site access and escape
- the ability to access external emergency support
- supervision and ratio levels
- experience and skill of the guides.

Note: It is common for operators to require children aged under 18 to have guardian consent to participate in adventure activities — New Zealand law does not give clear guidance on this topic.

Identifying and managing unsafe participants

Do not permit a person to participate in an activity if they are in such a state of impairment that they may be a hazard to themselves or to any person. Impairment could be due to factors such as social-psychological, cultural/language barriers, alcohol, drugs, injury, or fatigue.

Identify as a hazard any participant who is unable to perform safety procedures or follow instructions. Management strategies should suit the associated risk and include options such as increasing supervision levels or removing them from the activity.

7.2 Informing participants about safety

Managing safety is more effective if participants are well informed, particularly on the risks and requirements of alpine hiking. This section looks at four key aspects of informing participants about safety:

- pre-activity risk disclosure
- delivering safety information and checking for understanding
- general safety information
- using demonstrations and activity progressions.

Pre-activity risk disclosure

Before beginning the activity inform each participant of the following:

- Alpine hiking involves risk of serious harm or death. Participants should be aware that the operator cannot totally guarantee the participant's safety.
- The activity may be mentally and physically demanding.
- The participant needs to follow the guide's instructions at all times and understand that this is critical to their safety and that of the group.

Inform participants of significant hazards that cannot be avoided or that place extra responsibility on the participant. These include:

- sole guided trips
- trips that have potential to be halted, modified, or the potential to be stranded for extra days
- informing participants of the risk of a prolonged wait for emergency support in the event of an incident
- trips with limited communication access to external emergency support
- trips where the activities demand particular technical skills of the participant, such as scrambling and river crossings.

Note: When children are involved, ensure that pre-activity risk disclosure information is given to the correct people, such as parents and teachers, which may mean the information needs to be delivered twice.

Delivering safety information

Safety information should be delivered by a guide who has been verified as competent to do so. Ideally this person would be an experienced guide.

A safety information aid should be readily available to any participant who has difficulty understanding the initial briefing, e.g. videos, pictures and diagrams, practical demonstrations or written instructions in the participant's language.

Ensure, as best as is practicable, that the participant has understood the safety information.

General safety information

Instruct participants in awareness and techniques. This may occur pre-activity and during the activity. Factors to cover include:

- awareness of and warnings about the hazards of the activity
- the importance of listening to and following the instructions of the guide
- procedures for managing general exposure to edges and impact from falling objects, such as staying back from edges and the location of safe zones
- methods for maintaining body temperatures through clothing systems and regular hydration
- emergency procedures for the site, such as staying where they are and waiting for instructions from the guide.

For parts of the activity involving a significant hazard, or requiring technical skill to participate safely, inform participants of:

- the hazard and warn of its dangers
- options for avoiding the hazard
- any relevant communication systems such as visual hand signals
- the techniques required to negotiate the hazard or participate in the activity, such as procedures for use of technical equipment and performing technical actions
- applicable emergency procedures or self-rescue techniques.

Demonstrations and activity progressions

To help ensure participants are prepared and fully understand what they are required to do, use demonstrations and activity progressions where practicable, particularly for more difficult activities.

7.3 Supervising participants

Establish a supervision system that supports staff and participants to manage themselves and others safely. Supervision systems for operations where participants do not perform safety critical tasks are much less complicated, but no less important, than for those that do.

This section looks at what to take into account when establishing a supervision system and what to include in a supervision system.

Establishing a supervision system

Assess the level of risk that participants or staff will make errors leading to serious harm. Factors include:

- whether participants perform safety critical tasks
- for systems where participants perform safety critical tasks — the competence of participants, the likelihood that they will follow instructions, and their acceptance of responsibility for managing hazards
- the number and competence of staff

- the complexity and margin for error of the safety critical tasks
- the number of participants
- the nature of staff safety tasks, including the number of participants they are managing and the time involved — consider hazards such as task repetition and fatigue
- the general hazards of the activity or site
- good practice supervision levels – see below.

What to include in a supervision system

Ensure there is a staff member at the site responsible for managing the supervision system. This person should be an experienced staff member who will exercise good judgement.

This section looks at establishing a supervision system, and establishing levels of supervision and parameters for sole instructing or guiding.

Ensure the supervision system is based on the associated risk and includes:

- maximum participant numbers and minimum supervision levels for the site and its activities
- clarity on any specific, safety-critical actions that require particular attention during supervision
- clarity on staff supervision responsibilities, e.g. site areas, activities or participant groups
- strategies to enable staff to maintain the level of focus required to supervise effectively, e.g. buddy systems and minimising distractions
- clarity on procedures for ensuring supervision levels are maintained during unplanned staff breaks such as toilet stops
- procedures for managing participants waiting to participate in the activity
- guidance on when the supervision system may need adjusting, e.g. an increase in the number of participants, a change in competence of participants, a change in the number of children, an increase in the level of distraction, a change in environmental conditions, or less experienced staff.

A supervision system for alpine hiking

Factors to consider when assessing the risk include:

- the hazards of the activity and site
- the number of people exposed to the risk of slipping or falling from height at any one time
- the number of guides needed to adequately supervise participants
- the number of participants and over what time period
- the amount of time a guide is working in the safety role
- the complexity of the safety management system – including the equipment
- the competence of the guide
- the likelihood that participants will follow instructions
- participant safety responsibilities and competence.

Consider the points above and ensure the supervision system is based on the associated risk. Establish supervision levels as per the recommendations below.

Ensure there is a staff member at the site responsible for managing the supervision system. This person should be an experienced staff member who the operator is confident will exercise good judgement. For more information on site and activity management, see section 5.

Use other management strategies to eliminate guides' errors due to factors such as fatigue and repetition, e.g. checklists and keeping systems simple and consistent.

Setting supervision ratios

Using suitable supervision ratios is a crucial aspect of an effective supervision system. Establish a maximum number of participants for every alpine hiking activity.

The table below identifies common maximum ratios that are used with trained and experienced guides, fit and healthy participants, easy to moderate terrain, and good conditions:

Activity	Guide	Participants
Alpine hiking	1	10
Snow shoeing	1	10
Snow shelters	1	10
Instructional sessions	1	12
Sub-alpine hiking	1	15
Camping	1	15

The ratios may need to be decreased depending on the participants' ability, local conditions, activity difficulty, ability to self-rescue, the guide's experience, and other factors.

Groups over 15 participants should be managed as two or more separate groups.

If using an assistant guide, consider which hazard management tasks they are verified as competent to perform before factoring them into supervision levels. For more information on using assistant guides, see section 6.6.

For more information on establishing levels of supervision, go to:
www.supportadventure.co.nz/safety-management-plans/participants

Parameters for solo operating

Many trips and activities have a sole guide in the field. Solo guiding can involve an increased risk of participants being inadequately supervised if the guide becomes incapacitated or there is an emergency.

Inform participants how they can assist with managing these risks. Safety management strategies should be based on the associated risk. Options include:

- emphasising the heightened responsibility solo operating places on them
- emphasising the importance of following instructions
- training them in what to do if the guide becomes unable to assist them, e.g. instructing them to stay put, training them in how to call for outside help, instructing them how to get to a safe place, providing a map, and instructing them on how they can access and use the emergency shelter
- Identifying those with skills who may be able to assist
- training them how to maintain body temperature and how to use and access warmth sources.

The increased risk of participants spending longer on the activity in an emergency scenario is also present at sites with limited access to external emergency support. Solo operating at these sites may not be suitable or may require high ability levels from both the guide and participants.

Requirements for solo guides

Ensure that solo guides are experienced and verified as competent to manage the activity alone.

Factors to consider include:

- their level of experience and ability in the skills required for leading the activity, including managing emergency scenarios
- their degree of familiarity with the hazards of that activity and site
- their degree of familiarity with the operator's standard operating and emergency procedures
- the ability levels and experience of the participants.

Section 8: Equipment

This section looks at:

- participant and guide equipment
- emergency equipment
- equipment maintenance, testing, and inspection.

Note: Use equipment according to manufacturers' recommendations and current industry use, and that complies with relevant internationally or nationally recognised standards, e.g. the International Mountaineering and Climbing Federation (UIAA), the European Conformity (CE), and New Zealand and Australian Standards (AS/NZS).

8.1 Participant and guide equipment

Correctly fit equipment as per the manufacturer's instructions. Monitor equipment for fit throughout the activity. Ensure that all participants and guides use the following equipment:

- a helmet designed for the most relevant significant hazard presented by the activity, e.g. falling rocks or hitting head on rocks
- clothing that is sufficient to protect participants from risks such as hypothermia
- footwear that is sufficient for the environment and compatible with other equipment such as crampons and snow shoes
- torches, particularly on longer trips and when there is short daylight
- equipment that provides protection from all elements.

8.2 Emergency equipment

Guide equipment

Ensure that each guide has the following emergency equipment:

- clothing
- communications
- first aid kit
- shelter and spare clothing to survive a night out.

General emergency equipment

Ensure that group emergency equipment is sufficient and suitable for managing group safety and chosen based on identified emergency scenarios. The following items should be considered:

- group shelter and heat sources, e.g. space blankets, heat packs, bothy bags, ground insulation
- water
- high-energy food
- torches and spare batteries
- additional clothing.

Accessibility of emergency equipment

Ensure emergency equipment is usefully accessible. Options include guides attaching the equipment to their bodies, carrying the equipment inside a backpack, and caching it somewhere along the route. Ensure the group knows how to locate the equipment.

When determining how to ensure the equipment is accessible, consider the identified emergency scenarios and the nature of the activity or site.

First aid supplies

Ensure that first aid supplies are suitable for the identified first aid scenarios of the activity. Suggestions for first aid kit contents can be found at www.supportadventure.co.nz/other-resources#firstaid

8.3 Equipment maintenance, testing, and inspection

Maintain, inspect and test equipment regularly enough to ensure its reliability. Ensure maintenance, inspection and testing techniques and schedules are consistent with manufacturers' recommendations and reflect factors such as:

- normal operational wear and tear
- operational incidents
- time elapsed since the last check
- exposure to environmental factors that could have damaged the equipment, e.g. flooding or rock fall.

Pay particular attention to safety equipment that is permanently cached on site.

For more information on managing the equipment aspects of your operation, go to: www.supportadventure.co.nz/safety-management-plans

Section 9: Emergencies

Develop clearly documented and practised procedures for the full range of emergencies relevant to the operation, from incident management through to crisis response.

Train staff and ensure that suitable equipment is available to manage each emergency scenario.

Site, activity monitoring, and communication procedures are key components of your safety management system. They feature in both normal daily procedures and procedures for managing emergencies. They are addressed in Section 5.

This section looks at:

- good practice for accessing external emergency support
- contingencies for limited access to emergency support.

9.1 Accessing external emergency support

Ensure that suitable external emergency support is available as soon as is practicable and within a planned period of time — ideally within daylight hours. Specify this period of time in the operation's emergency procedures.

When conducting emergency planning and developing emergency procedures, consider factors that could affect the availability of suitable external emergency support. These include:

- the ability to call for external support from the site
- the type of external emergency support required by each emergency scenario
- site access and evacuation options
- capacity and ability of local rescue resources, e.g. community rescue agencies.

9.2 Contingencies for limited access to emergency support

Where sites are at locations with limited access to suitable external emergency response, there is a risk that injured participants may spend longer without secondary emergency care. Choose hazard management strategies based on the associated risk. Options to consider include:

- informing participants of the risk of a prolonged wait for emergency support in the event of an incident
- using more experienced guides and ensuring they are competent to manage identified emergency scenarios for an extended period of time — such as by holding a first aid qualification that includes managing scenarios over a longer period of time
- finishing activities early in the day to allow time for an overdue activity response and rescue
- considering accessibility when determining guide to participant ratios, assessing participants, and setting competence requirements for guides
- taking extra care and considering excluding avoidable higher risk activities, such as choosing less challenging routes
- training with or informing local rescue response personnel on site access and escape routes
- having resources available such as additional first aid equipment to manage an injured participant for longer periods of time.

For more information on developing procedures for emergency management, go to: www.supportadventure.co.nz/safety-management-plans/emergencies

Section 10: Safety System Reviews

Regular internal and external safety system reviews or audits are a crucial part of running a safe operation.

Some operations may be required by the Adventure Activity Regulations to undergo an external audit against the Safety Audit Standard before beginning to operate. To view the audit standard, go to: www.business.govt.nz/safety audit standard for adventure activities – requirements for a safety audit of operators

Conduct an internal, and potentially external, safety system review after an incident that caused or might have caused serious harm.

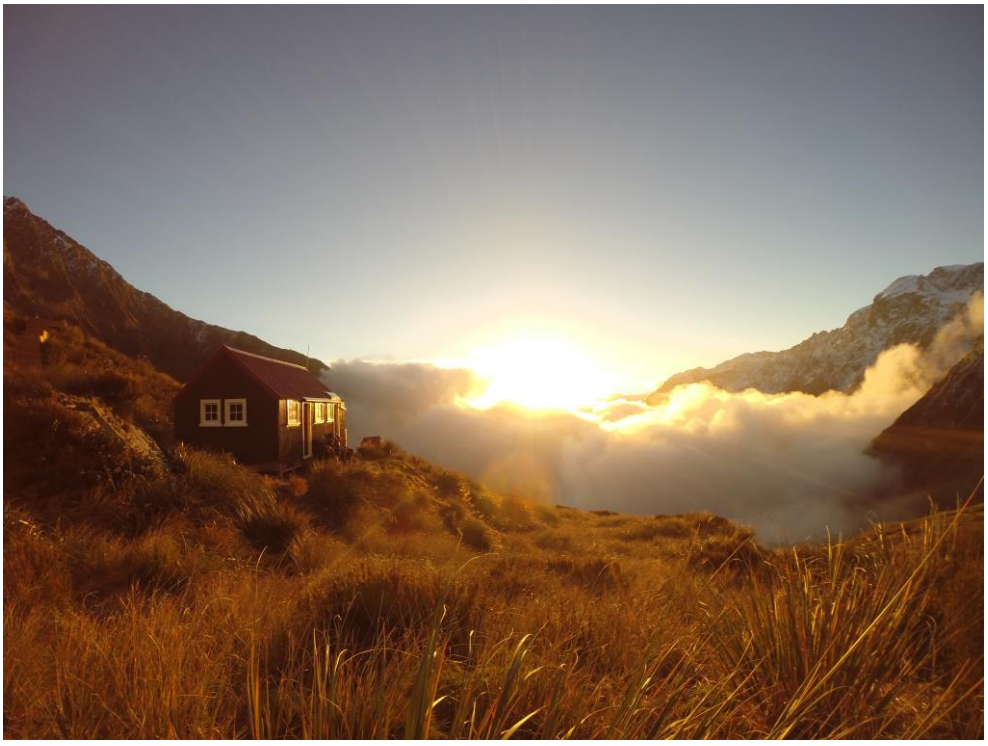
Schedule internal reviews as part of the annual safety routine — before and after the busy season are often good times. Reviews should check that:

- safety systems and procedures are aligned with the recommendations in this guideline and are at or above industry good practice
- the safety management plan accurately reflects the operator's systems and procedures
- everyone in the operation follows the agreed safety systems and procedures.

One person should be responsible for ensuring that reviews take place, but everyone in the operation is responsible for being part of the process.

Record the process and the results, and share any relevant learning with staff and other alpine hiking operators.

For more information on safety system reviews, go to:
www.supportadventure.co.nz/safety-management-plans/checking-your-systems



Chancellor Hut, Fox Glacier. Photo: Marius Bron

Appendix: Health & Safety Terms

This guideline uses several terms you need to understand to be sure you comply with the health and safety legislation. This appendix looks at those terms, and what they mean for managing hazards.

The terms are:

- practicable steps
- hazards and significant hazards
- serious harm.

All practicable steps

The health and safety legislation says you must take all practicable steps to safely provide adventure activities. You must take all steps that are reasonably practicable in the circumstances considering:

- the nature and severity of any injury or harm that may occur
- the likelihood of that harm occurring
- how much is known about the potential harm and the measures for eliminating, isolating or minimising the hazard from which the harm may arise
- the availability and cost of those measures.

Note: The 'circumstances' are those that an operator knows about, or ought reasonably to know about, taking into account good practice and knowledge throughout the adventure and outdoor sector.

The operator is responsible for balancing the likelihood and seriousness of potential harm against the cost, effort and effectiveness of measures.

Where there is a risk of serious or frequent injury or harm, a greater cost in the provision of safeguards may be reasonable. If there are significant hazards and the measures are too expensive, unavailable or ineffective, the only reasonable safeguard might be to cancel the activity.

Any judgement of whether a safeguard was 'reasonably practicable' will take into account good practice and knowledge throughout the industry.

The SupportAdventure website has a guide – *Health and Safety Act Made Easy*
www.supportadventure.co.nz/health and safety act made easy

Hazards and significant hazards

The Act says an adventure activity operator must take all practicable steps to systematically and regularly identify, assess and manage significant hazards. Hazards that are not significant also need to be managed and this process may be applicable to those hazards too.

'Hazard' describes a danger or a potential source of danger. A hazard may cause or contribute to an incident. So a hazard may be:

- always present, such as a sharp edge that may injure or snag a participant or equipment
- potentially present, such as water levels that might rise after rain, or guide fatigue.

'Significance' is a combination of the likelihood of the potential harm and the seriousness — how bad the harm could be if it occurs, even if it is unlikely to happen.

The Act defines 'significant hazard' as a hazard that does or could cause:

- serious harm; or
- harm due to exposure over time; or
- harm that does not usually occur or become apparent until a significant time after exposure to the hazard.

Note: A hazard may include a person's behaviour including the effects of drugs and alcohol use, and physical or mental fatigue.

For more information on hazards and hazard management, go to:
www.supportadventure.co.nz/safety-management-plans/hazards

Serious harm

Harm is illness, injury, or both, and includes physical and mental harm. Serious harm is death, or harm of a kind defined to be serious for the purposes of the Health and Safety in Employment Act 1992. The Act does not give a simple definition of serious harm, but gives examples including:

- death
- conditions that result in permanent loss of bodily function, or temporary severe loss of bodily function such as eye injuries or bone fractures
- loss of consciousness from lack of oxygen
- harm that requires hospitalisation for 48 hours or more.

Operators should also manage hazards that could result in harm other than serious harm. The most common alpine hiking injuries that aren't serious harm are sprains and strains.

To read the Health and Safety legislation definition of serious harm, go to:
www.supportadventure.co.nz/health and safety act made easy