

Risk Management With Mandatory Upper Risk Threshold in the World's Largest Mountaineering School

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At the beginning of the new millennium, the DAV Summit Club, the commercial mountaineering school of the German Alpine Club and world's largest provider of commercial mountaineering has developed a risk framework with mandatory upper risk thresholds. In collaboration with Werner Munter, the system is based on the reduction method and targeted for the out-of-bound skiing, ski-touring and ski-mountaineering activities of the mountaineering school. Every trip must already in the planning phase fit into the defined risk framework. In the terrain every guide is free to adapt the announced program based on conditions and abilities of the clients, but must equally stay within the upper limits and preferably below by setting the priority of the guiding in providing a very satisfactory client experience at the reasonably low residual risk threshold. All guides report on a daily basis on a web based interface about the touring condition as well as the risk management decisions. The current database contains ten thousands of skier days provided by hundreds of guides. It includes therefore real terrain usage data connected with the implications given by the risk management framework and as one of the many findings proof as an important signal to the guiding industry that there is no positive relationship between providing a high-risk experience and client satisfaction.

Keywords: Risk Management, Residual Risk Threshold, Mountain Guiding

Introduction

In November 2000, the "Summit Club", commercial mountaineering school of the German Alpine Club introduced a new protocol for the daily winter guiding operation. The protocol was introduced by Peter Geyer, former president of UIAGM, in collaboration with Werner Munter. Where as the data has been manually collected on paper for the first few years, it is today entered in a web based form and directly stored in a database.

The database includes an average of 2'500 guided activity days and 15'000 skier days per season and therefore sums up approx. 32'500 activity days and almost 200'000 skier days.

Although the activities are not only within the field of "skiing", all reported activities include exposure to avalanche terrain such as in ice climbing, snowshoeing, winter mountaineering etc. However, the vast majority of the activities is within traditional ski touring, ski-plus and off-piste skiing with a very low percentage of snowboarding.

A substantial part of the benefit of the system that it requires a systematical assessment and reporting of the situation on a daily basis. It objectively looks at the residual risk level, which is part of the output of the implemented reduction method algorithm.

The Reporting System

The daily reported data includes:

- General avalanche conditions
- New snow rated with the "critical amount of new snow scale"
- Wind

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- Stability of the uppermost layer interface in the snowpack
- General rating of the snowpack stability (What is the main problem in the snowpack)
- Temperature trend and its expected impact on the snowpack in short and mid-term perspective
- Expected snow stability at high elevation in this mountain range
- Wumphing noises
- Observation of recent, natural avalanche activity
- Likelihood for remote triggering
- Total amount and distribution of snow
- Snow quality
- Surface
- Skiability
- Conditions for glacier travel, crevasses, snow bridges
- Avalanche danger degree given by the bulletin
- Correction of bulletin +/- based on observations on the local and zonal 3x3 scale and Nivotest
- Expected danger degree trend based on current weather forecast
- Danger potential as Reduction Method input variable (16 step scale, to describe Low, Moderate, Considerable and High on a finer scale)
- Selection of first class reduction factors (steepness)
- Selection of second class reduction factors (aspect & frequency of terrain use)
- Selection of third class reduction factors (group size and spacing)
- Identification of the “main weather/snow problem” of the day

Danger Potential

49% of the activities have taken place in avalanche danger degree 2, 40% in degree 3. When the given avalanche degree by the bulletin was corrected based on regional and zonal observations, this mainly occurred in situations where the degree was between 2 and 3. The guides therefore corrected a “serious 2” or a “weak 3” often to danger potential 6, which represents on the higher resolution danger potential scale (applied in the professional reduction method) the value exactly between EUROSCALE 2 and 3. Danger potential 6 was entered in the database for 10.5% of the activity days.

Residual Risk

In 51.5% of the activity days, the end result of the reduction method was below 0.5, in 33.1% of the cases between 0.5 and 1, in 12.5% exactly at 1 and only for 2.8% of the activities the range >1, but within the “limits” (<2) has been used, applying the additional precautions recommended for this range such as limiting the amount of skiers in the exposed zone.

Analysis of Activities > RM1

Within the activities which have taken place at RM>1, there are three predominant patterns:

- a shift of activity toward out-of-bounds skiing activities
- a shift toward more educational activities
- “first day” of multi-day trips, in particular in connection with a hut ascent
- “last day” of multi-day trips, in particular in connection with a hut descent

The last two patterns will be taken into account for further optimizations of the program as well as the planning of the guiding agenda.

Case Fatality / Accident / Incident Rate

Fortunately, there was no deadly accident within the observation period, therefore the case fatality rate cannot be conclusively determined. However, it is currently greater than 1:200'000 for a skier day, which is very clearly exceeding the aim of the author of the reduction method. There are only very few known comparative values, among them one of a national Alpine Club of the European Alps which averages with an approx. 1:50'000 case fatality rate in their non-commercial, "Alpine Club Tour Leader" qualification guided programs.

Concerning the accident rate, the situation is the same, there are no events which lead to injuries or intervention of organized rescue in the observation period.

The incident rate includes one event on March 16, 2006 where 4 skiers were partially and two completely buried by an avalanche of 81m in length and 110m in width. Thanks to efficient self- and companion rescue, all within the same group, the event ended without any damage. With 6 skiers involved, the avalanche incident rate is 1:33'333.

These statistics should not lead to the impression that nobody has been hurt during the 200'000 skier days, there are obviously much more, non-avalanche related risks involved in ski-touring and out-of-bound skiing such as a fall, collision with other skiers or objects etc.

However, the achieved avalanche related statistic proves that the organization and guides make on a daily serious, above average efforts to run their programs as save as reasonably possible in providing a great guest experience in mountain skiing and mountaineering activities.

Influence of restrictive, mandatory upper risk threshold to client satisfaction and client return rate

Lowering and enforcing mandatory upper risk thresholds will consequently lead to a lower fatality / accident rate. However, the benefit of a lowered residual risk, does not come without

limitations in what type of terrain may be skied in certain conditions. This limitation of freedom is the price which needs to be paid.

As many commercial guides bring such limitations directly in connection with a less attractive program for the guest, leading to lower guest satisfaction and a decrease of the client return rate, it is of utmost importance that this study explicitly examined the connection between guest return rate and perceived program limitations. Even when looking specifically at weeks with bad weather conditions, high danger potential etc, there is, with very few exceptions NO positive correlation between providing higher exposure skiing and higher client return rates nor there is a positive correlation between skier days with risk framework imposed restrictions and a lower client return rate. Neither of the conclusions means that in the affection of "the steep and deep powder" on one side or the "decision to turn back 50m below the summit" on the other side there are no positive / negative emotional outbreaks. But in the mid-to-long term perspective, these in-situ affected reactions do not influence the client return rate.

The ability of the guide to recognize terrain with good skiing quality and guest satisfaction is a therefore a very important factor.

Future Perspective

While analyzing the database, the data consistency in certain variables as well as some specific points of the reporting system were identified as sub-optimal and will be optimized in the future. Concerning the reduction method, the value of the reduction factor "frequently skied" probably could be optimized by splitting the factor in a higher value option for *constantly skied, groomed-slope-like conditions* and a lower value factor representing the *currently totally tracked up, classical ski touring* sectors.

Acknowledgements

The authors would like to thank the Summit Club for the opportunity to analyze this unique data set, in particular for the support provided by Manfred Lorenz as well as to Peter Geyer and Werner Munter for their long term vision when starting the project 13 years ago.