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Avalanches in areas used for snow sports

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Introduction

Fundamentally, avalanches should not occur in areas used for snow sports, at least this is the definition, so to speak, that determines an area used for snow sports. When a slope that is marked out for snow sport use is opened, the company that manages the ski lifts assumes the responsibility of ensuring that nobody is injured. So with the obligation to provide slope safety in mind, the same company must therefore take all reasonable measures to safeguard the ski slope users from the possibility of mountain-related dangers e.g. avalanches. The measures that a company is duty-bound to take to avoid being sued, either publicly or privately, are essentially set out in the guidelines published by the Swiss Commission for the Prevention of Accidents on Snowsport Runs (SKUS) – these pertain to the area covered by the Swiss Confederation. According to provisions in case law issued by the court of cassation, the rules drawn up by SKUS covering the construction, working and maintenance of downhill slopes for snow sports are now viewed as a necessary criteria for accident prevention.

Accident Statistics

The accident statistics actually highlight the fact that fatal incidents associated with avalanches in areas used for snow sports are extremely rare. In Switzerland, avalanches have registered an average of approximately 26 victims over a span of many years (Figure 1). The majority of those who lost their lives were practising winter sports and ventured beyond the slopes which were marked out and controlled for skiing and consequently entered the off-piste area; therefore in this instance, the people involved were excursionists in more than half the cases, whilst the rest were off-piste skiers although they would have started out from an official skiing area. The Swiss statistics records accidents that take place on slopes open (or even closed) for snow sports as accidents attributable to the slope traffic; these statistics record accidents associated with avalanches based on a duty to provide safety on the slopes. According to an average figure put together over a thirty-year period, less than 10% of avalanche victims can be attributed to traffic on the slopes. Of these, only a fifth was using a ski slope: this data corresponds to approximately one death every two or three years. To this we should add that the number of searches carried out every year when open slopes are buried by an avalanche is constantly on the increase. We also need to calculate that an accident occurs in the workplace every three or four years, which means that an avalanche is responsible for the death of somebody at work as they prepare the slopes or try to make them a safer place.

This highlights the fact that avalanches occur every now and then and hit the areas used for snow sports, despite the high standards of safety which are enforced. These avalanches still occur despite

the fact that 75 tons of state-of-the-art explosives are employed every year as preventative measures. These are used to create explosions to cause the artificial detachment of avalanches that threaten to encroach upon areas used for snow sports. The fact that avalanches occasionally detach quite unexpectedly does not mean that due care has not been taken; rather that it is just a naturally occurring event. In fact, despite the most advanced preventative techniques or the vastest wealth of experience, it is still impossible at present to accurately predict the exact moment and location in which an avalanche detachment will occur.

By analysing accident statistics, we can see that there are generically five typical situations in which accidents occur in areas used for snow sports:

- An avalanche spontaneously detaches and falls on a ski slope (Example: Oberrothorn, Zermatt (VS), 18th April 1994).
- Off-piste skiers cause an avalanche to detach above a ski slope; this avalanche then totally or partially covers the facility (Example: Pleus, Elm (GL), 3rd February 1985).
- A patrol or snowcat is buried during maintenance work (Example: Gürgaletsch, Tschierschen (GR), 27th December 1999) (Figure 3).
- Several skiers cause an avalanche to detach outside the controlled, marked slope, causing damages or involving other people (even off-piste) (Example: Parsenn, Davos (GR), 21st February 2000).
- An avalanche which has been artificially triggered damages property e.g. to a pylon or a farm building for instance (Example: Rothorn, Sörenberg, 8th February 1999).

Legal Consequences

The first four of the above-mentioned situations can have consequences on a penal level for the companies involved or for their employees. Whilst this is evidently clear in the first case, if we consider an avalanche caused by off-piste skiers which has led to the injury or death of other users of the downhill facility further down the slope, blame is considerably less clear. However the Swiss legal system is extremely clear in this regard: the company must guarantee safety on the slopes and consequently take into consideration the fact that the avalanches don't only detach from the mountainside spontaneously but that they also can be caused by skiers travelling around off-piste. In the third situation mentioned above, the possibility of legal consequences is once again clear. But in the fourth situation, the one in which the skiers caused the avalanche to detach in an off-piste area, one just needs to establish whether or not the company responsible for the ski lift has done enough to make skiers aware of this possibility. In particular, has the slope been adequately marked out? Is there a sufficient number of warning signs positioned in the right places to alert slope users to the avalanche danger in off-piste areas? In the last situation on the list, legal consequences would only result in the event that damages outside of the area used for snow sports were comparable to those produced in periods characterised by particularly heavy snowfalls.

Conclusions

Preventing the dangers posed by an avalanche is, and will always be, one of the key tasks faced by those responsible for safety in areas used for snow sports. Incidents are rare, mainly because avalanches are artificially detached with the use of explosives. The legal system has basically influenced this favourable situation from the skier's point of view, however due to the fact that the mountains in winter and, more specifically, the practice of snow sports conceal a range of dangers, users are fundamentally obliged to always behave in a responsible manner. It is impossible to guarantee safety at 100%: even if all the programmed safety precautions are applied with the utmost care, the risk, however slight, of an avalanche will always be present.

Bibliography

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Captions:

Figure 1: Statistics of avalanche victims in the Swiss Alps (from the 1976/77 season to the 2005/06 season).

Figure 2: An unexpected avalanche following an unsuccessful detonation attempt – Naraus ski resort, Flims (GR), 6th February 2003 (Photo: W. Düsel).

Figure 3: An incident that occurred following an artificial avalanche detachment to make the slopes safe. The driver of the snowcat found himself in a danger zone due to the lack of warning signs: he was hit by the avalanche and buried inside his vehicle. He later died as a result (Photo: J. Schweizer, SLF).