

FRANCE : HOW TO IMPROVE THE AVALANCHE KNOWLEDGE OF MOUNTAIN GUIDES ?  
THE ANSWER OF THE FRENCH MOUNTAIN GUIDES ASSOCIATION

Alain Duclos<sup>1</sup>  
TRANSMONTAGNE

Claude Rey<sup>2</sup>  
SNGM

ABSTRACT :

The French Mountain Guides Association<sup>3</sup> (*Syndicat National des Guides de Montagne*,) organises continuing training for its members. Since 1998, the focus of the training involves around mountain risks in the winter, in 2003 it will be re-evaluated. The training is designed to give guides a better appreciation of the dangers they are likely to encounter, enabling them to take the necessary precautions. The objective is to reduce the number of accidents and the number of victims.

Four years into the programme, the impact of the avalanche awareness training can be assessed. The effectiveness of the course is measured both by the numerous written remarks made by the trainee guides, and by the instruction reports drawn up by the instructor guides. The success of the programme is evaluated by analysing the avalanche accidents involving French Mountain Guides.

This approach has led us to completely change the avalanche course. The section devoted to the evolution and study of snow crystals and the snow-pack has been reduced, while the part devoted to the explanation of the avalanche triggering mechanism and to the study of real cases has been increased. These cases include accidents that have been the subject of expert appraisals by the Guides Association. We have put the emphasis on remote triggering phenomena, on the dangers related to thin snow covers, and on the difficulties in analysing snow-packs that often are very heterogeneous over short distances.

A new avalanche typology has been created, on which the course is now based. Situations have been classified according to our current ability or inability to predict whether avalanches are likely to occur.

KEYWORDS : avalanche course ; mountain guides

INTRODUCTION

With 1634 professional mountain guides registered, the French Mountain Guides Association is responsible for ongoing training of the largest Mountain Guides Association in the world. While out-of bounds skiing, ice climbing and other winter recreational activities are increasing, we are more and more exposed to avalanche danger, and so are our clients. For these reasons, we have decided since 1998 to focus the ongoing training on an avalanche programme.

The long term challenge of the efficiency of this programme can partly be measured with

the number of avalanche deaths involving guides or their clients. To improve the course, we are trying to take into account the feedback of the mountain guides after each ongoing training session.

This had led us to entirely change the contents of the course. Now, our goal is to help the guides distinguish the situations for which the avalanche risk is the most delicate to establish, in the aim to lead them to take more mitigation measures. We give them the technical explanations of the most recent

<sup>1</sup> Corresponding author address : Alain Duclos, (E-mail : [a.duclos@wanadoo.fr](mailto:a.duclos@wanadoo.fr)), TRANSMONTAGNE, 15 rue de la Buidoinnière, F 73500 Aussois – France, Tel : (33) 479 203 205, Fax : (33) 479 203 592, web site: [www.perso.wanadoo.fr/duclos.transmontagne/](http://www.perso.wanadoo.fr/duclos.transmontagne/)

<sup>2</sup> Claude Rey (E-mail : [claudio-rey@wanadoo.fr](mailto:claudio-rey@wanadoo.fr)), SNGM, 65 rue du Larith, F 73000 Chambéry - FRANCE

<sup>3</sup> Member of UIAGM/IFMGA

research, and we also define the limits of those explanations.

## 1 AVALANCHE DEATHS INVOLVING FRENCH MOUNTAIN GUIDES

### 1.1 *The data we used*

From the data base of the French Mountain Guides Association, we managed to obtain the number of accidents involving guides since 1980, and their consequences. The dates, hours, and places of the accidents were specified, including the ones involving guides alone, or practicing an extra-professional activity.

We also obtained from the ANENA<sup>4</sup> the information related to the avalanche accidents registered in France from the last twenty years.

Taking only into account the fatal accidents, we have calculated the number of avalanche death involving French guides for each season (from September 1<sup>st</sup> to august 31<sup>st</sup>) since 1980, all over the world. We did the same operation for all the accidents that happened in France, and subtracted from those ones the victims already involved with the French guides activity.

### 1.2 *Results and target*

The average of avalanche death involving French guides between 1980 and 2002 is a slightly more than 4. The average of avalanche death in France, not involving guides, is between 28 and 29. Using an histogram (Figure 1), we observe large variations from one season to the other. To have a better idea of the tendency, we calculated the polynomial regressions. During the first ten years (until 1990) both tendency show a decrease. Then, while the tendency of the category without guides goes on to decrease and seems to stabilize, the category of the guides and their clients increases. This regrettable evolution can be due to several factors. One of them is the increase of the number of mountain guides: from about 1000 in 1980, we reach 1634 in 2002. Another factor is probably the increase of the out-of

<sup>4</sup> ANENA : Association Nationale pour l'Etude de la Neige et des Avalanches, Grenoble, France

bounds practice with professionals, but we are not able to estimate this effect.

However, the objective of the French Mountain Guides Association is to stabilise this evolution. One mean is probably the training.

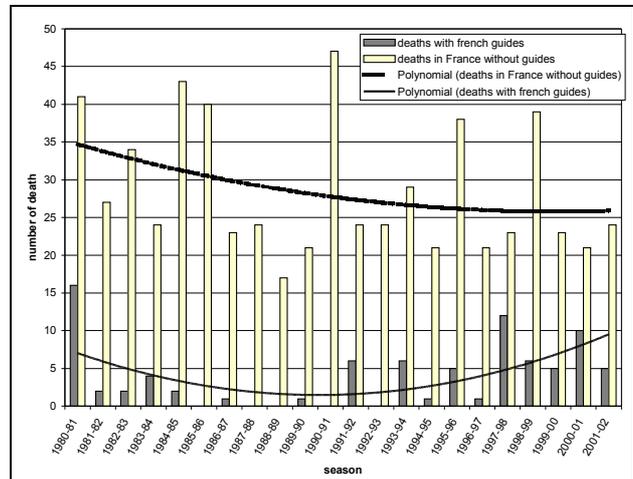


Figure 1. Evolutions of avalanches deaths, wether French Mountain Guides are involved or not.

## 2 ONGOING AVALANCHE TRAINING

The avalanche training for the French Mountain Guides involves at least in two steps. The first step includes the courses given by the National School for Ski and Alpinism in Chamonix (ENSA<sup>5</sup>).

The second step is the ongoing training performed by the French Mountain Guides Association. In fact, once certificated, each mountain guide must have a refreshment every 5 years ; it lasts 3 days during which the following topics are treated :

- Snow and avalanches theory
- How to guide in avalanche terrain (theory)
- Beacon theory
- Beacon practice
- Study of European avalanche scale and bulletins
- 3x3 checking and reduction method
- First aid

The first topic was the most delicate to present. During a first period, we made very methodical presentations, including snow metamorphism and temperature gradient study. Some guides were lacking interest, and

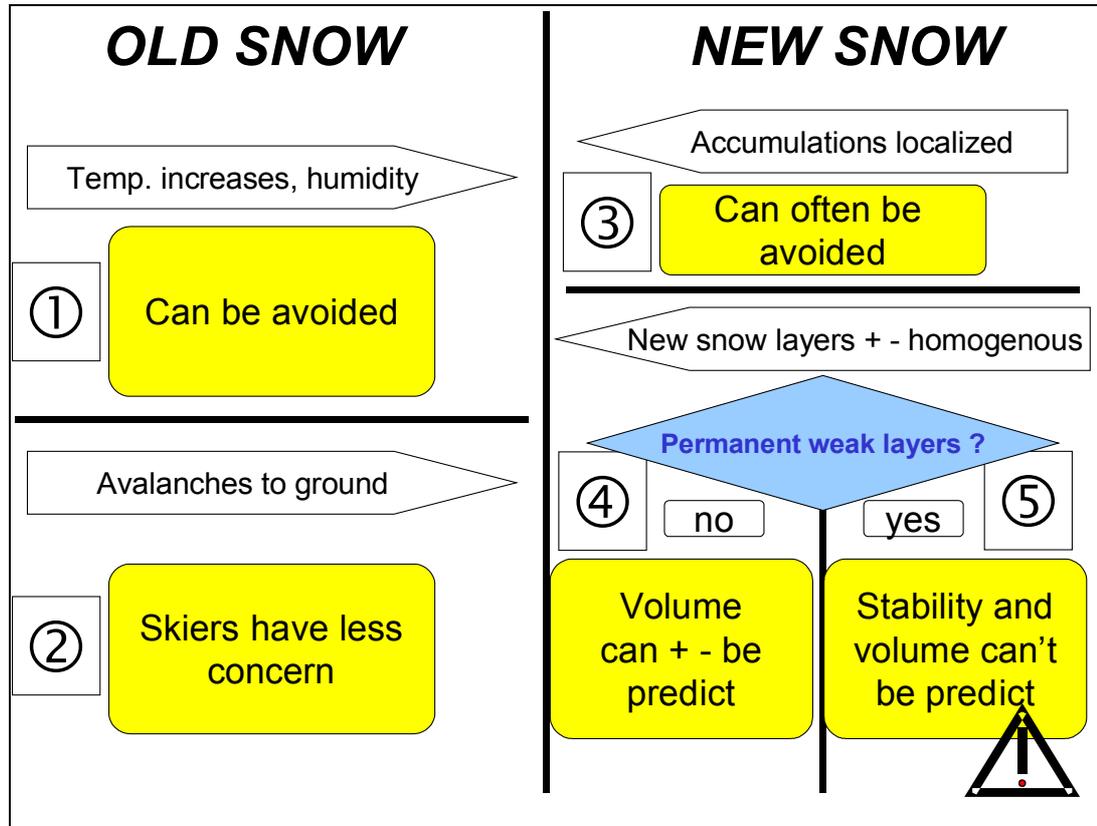
<sup>5</sup> ENSA : Ecole Nationale de Ski et d'Alpinisme

gave us the feeling we were too detailed. After the first period, we began to present more and more practical cases, including recent accidents involving guides. Most of the trainees were very interested, but they had the feeling that avalanche risk was everywhere. After each session, the guides were asked their impression. The feed back could be roughly summarized in three points :

- “Avalanche courses suggests that there is always a risk of avalanches !”
- “However, our judgement, knowledge, skills... allows us to ski thousands of slopes without problems”
- “Each year, some of us die or are injured in avalanches, despite being cautious”.

Session after session, this feed back has lead us to imagine two new concepts, allowing a clearer and more efficient presentation of the avalanche course.

3 TWO CONCEPTS WE ARE TRYING NOW



3.1 *Five types of avalanche danger*

The goal of the first concept is to show that, even if in many situations avalanches are likely to occur, the professional is able to deal with most of them. We established a kind of classification based on the observations registered in our Avalanche Information System [A. Duclos & alt, 2000] (Figure 2). In the same time, we wanted to help the guides identify a situation (number 5) when avalanches occurrence and volume can't be predict. Those occurrences can mobilize the old snow under the new snow ; they also can be remotely triggered avalanches.

Once this concept has been presented, it is more convenient to explain the trainees why we have to study together on some technical issues (i.e. remotely triggered avalanches mechanism).

Figure 2. Types of avalanches distinguished versus the ability a professional can have to deal with them.

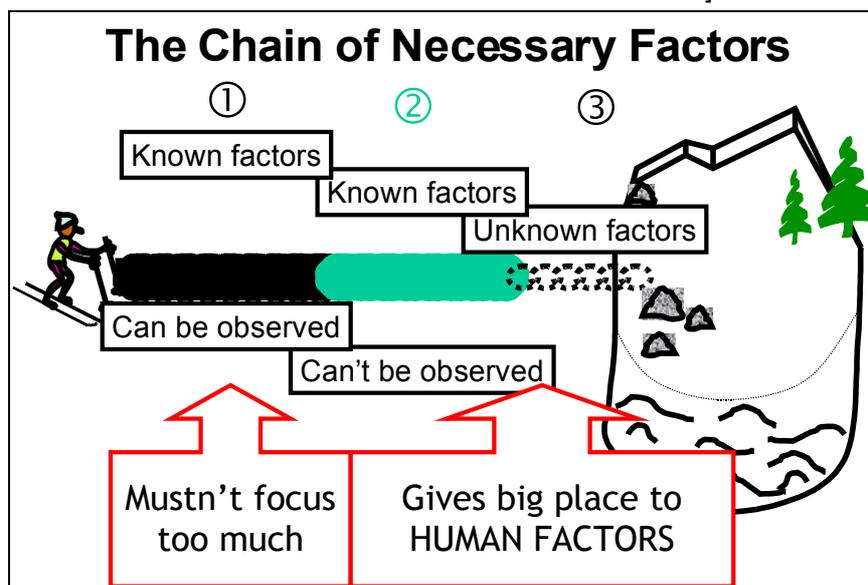
### 3.2 The chain of necessary factors

The goal of the second concept is to explain why it is sometimes impossible to predict with accuracy the stability, and the volumes which might be mobilized by a potential avalanche.

In fact recent studies have shown that slab avalanches belongs to the group of complex phenomena, similar to other geophysical phenomena [Failletaz & alt. 2002]. This allows us to believe that numerous factors involved

In addition, we assume that some of the factors influencing avalanche activity are known but can't be observed (i.e. past avalanches, spatial variability, critical size of the basal crack, etc.).

This may suggest that the accurate examination of the known factors (i.e. stratigraphy, tests results, slope angles, etc.) mustn't lead to certitudes. Additionnaly this lack of certitudes has lead several authors to focus more on human factors [Atkins 2000, Mc.Cammon 2000].



in avalanche phenomena are still unknown.

Figure 3. Three types of factors may be involved in avalanche phenomena, versus their ability to be observed and exploited for prediction

## 4 CONCLUSION

Aiming to improving its efficiency, The French Mountain Guides association has established two new concepts introducing the ongoing avalanche training.

The first concept distinguishes 5 types of situations where avalanches are likely to occur. We assume that one of this type can produce avalanches whose occurrence and magnitude can't be predict.

The second concept shows even being cautious, professional mountain guides or their clients can still be caught by slab avalanches.

That's why we are now focusing on :

- The new knowledge coming from research and observations,

- The human factors
- The mitigation measures

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