

## EDUCATING SKI PATROLLERS AT CHIMBULAK (SHYMBULAK) SKI RESORT, KAZAKHSTAN

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**ABSTRACT:** Chimbulak ski resort, located close to the former capital city of Kazakhstan, Almaty, has challenging preconditions to make their resort avalanche safe. (1) No official avalanche bulletin is available (2) Using explosives to trigger avalanches is not allowed (3) There is no complete avalanche safe piste under hazardous condition. Therefore a 10 days avalanche safety and decision training course for the ski patrollers was planned to overcome those difficulties. The training consisted of a safety training including beacon search, organized search and a competition against the groups of the ministry (who search for victims outside of ski resorts). A training how to make their own avalanche bulletin, including weather forecasting, snow physics and snow pack stability evaluation using stability tests such as CT, ECT, and Rutschblocktest. Together with all members of the resort a hazard map as well as an inclination map of the resort was produced so typical avalanche triggering zones and avalanche run out length were determined. Further on a Daisy-Bell was used to trigger avalanches, as releasing avalanches not using dynamite is allowed. To help the ski patrollers applying the new gained knowledge one expert of SNOW-CONTROL stayed at the resort for the whole winter season.

### 1. INTRODUCTION

The ski resort Chimbulak (Shymbulak) is located close to the former capital city of Kazakhstan, Almaty (Fig.1 and Fig 2) in the east of the country not far from the border to Kyrgyzstan (Fig. 1). A 30 to 40 minute drive by car takes you from Almaty up to the ski resort that is situated in the Tian Shan mountain range (Fig. 3). The climate is typically continental, with snow storms mainly arriving from the north-west.

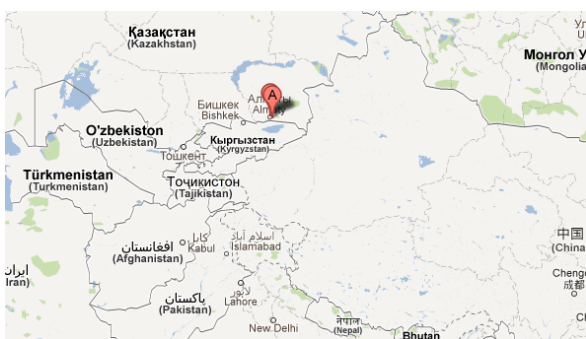


Figure 1: Location of Almaty, (maps.google.com)

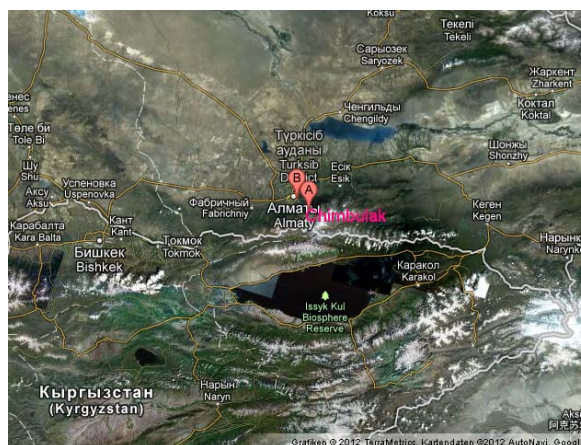


Figure 2: Location of Chimbulak (maps.google.com)



Figure 3: Road to ski resort (Almaty in the back)

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The ski resort has currently 5 ski lifts and is in the process of growing. The piste from both lifts arriving at the mid-station are potentially prone to avalanches as well as the section above the mid-station (Fig. 4 and Fig. 5).



Figure 4: Map of Chimbulak ski resort

## 2. TRAINING

Chimbulak has challenging preconditions to make their resort avalanche safe. (1) No official avalanche bulletin is available (2) Using explosives to trigger avalanches is not allowed (3) There is no complete avalanche safe piste under hazardous condition. So, the training consisted of a safety training including beacon search,

organized search and a competition against the groups of the ministry (who search for victims outside of ski resorts). Several TV-stations broadcasted this event (Fig. 6). A training how to make their own avalanche bulletin, including weather forecasting, snow physics and snow pack stability evaluation using stability tests such as CT, ECT, and Rutschblocktest was carried out as well (Fig. 7 and Fig. 8).



Figure 5: Chimbulak ski resort



Figure 6: Rescue competition filmed by TV-stations

Snow pack conditions are typically instable in the beginning of the ski season as low air temperatures and shallow snow packs produce significant depth hoar layers. As usual in spring time warming allows for major wet snow avalanches.

So, to reduce snow pack heights along the season a Daisy-Bell was used to trigger avalanches, as releasing avalanches not using dynamite is allowed in Kazakhstan (Fig. 9 and Fig. 10).





Figure 7: Snow stability evaluation



Figure 10: Daisy bell used for avalanche triggering



Figure 8: Avalanche warning sign at Chimbulak ski resort, snow pack stability evaluation early in the morning before opening of the ski resort.



Figure 9: Helicopter used for avalanche triggering

### 3. CONCLUSION

We could carry out a 10 days avalanche safety and decision training course. All participants were enthusiastic and well equipped. To help the ski patrollers applying the new gained knowledge one expert of SNOW-CONTROL stayed at the resort for the whole winter season.

### 4. ACKNOWLEDGEMENTS

We thank everybody at Chimbulak ski resort (organizers and attendants) for the welcoming and hospitably atmosphere while the course took place.