

Wyssen Reference Project

Eiger North Face - How to do avalanche control in severe terrain



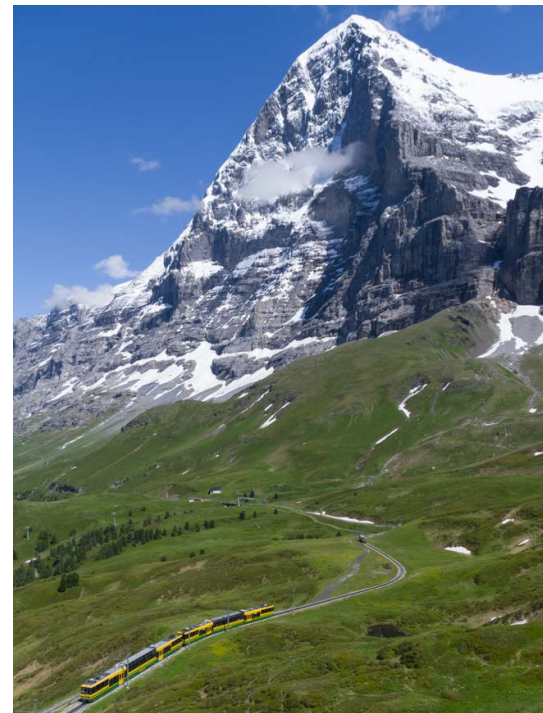
Safety through **innovation**

wyssen
switzerland  **avalanche
control**



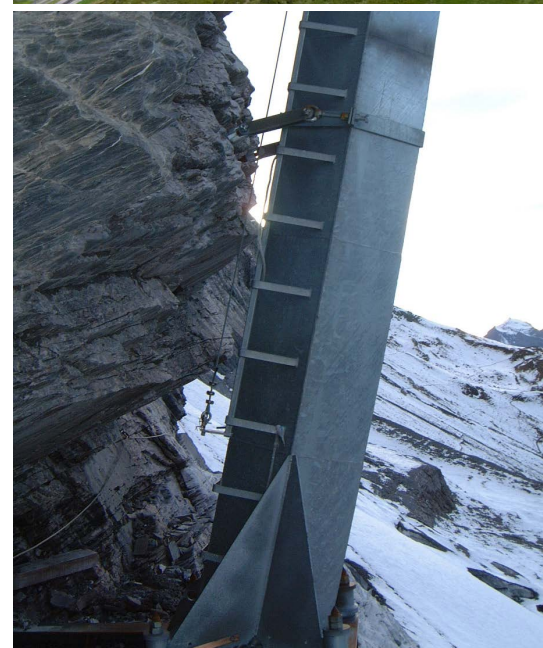
Avalanche Protection from Eiger North Face

Project:	Avalanche Protection from Eiger North Face
Place:	Jungfrau Region
Country:	Switzerland
Year:	Installation 2003
Customer:	Wengernalpbahn AG
Protected Object:	Railway between Grindelwald and Kleine Scheidegg, Ski slopes, Ski resort
Installed Systems:	Wyssen Avalanche Tower 12 shots



How this came about...

In 2003, an Avalanche Tower was installed in the lowest part of the Eiger North Face to protect the Wengernalp railway on its way up to the Jungfrauoch. The aim of this measure was to protect a section between Grindelwald and Kleine Scheidegg that had not been protected by snow sheds. Most endangered parts are protected with snowsheds. The reason that the whole line is not protected by snow sheds is that the tourists can enjoy the impressive panorama of the Eiger North Face along the route. The person then in charge of safety Ueli Frutiger, decided to look for a solution that did not obscure the view all along the line. Therefore it had to be a temporary measure, indicating that a remote avalanche control system RACS was needed.



Challenging placement and construction of the anchorage

The world famous Eiger North Face is known by its climbers on one hand for its climbing difficulties and on the other hand for its objective hazards such as for example rapid weather changes, avalanches and rock falls. It was known that Wyssen Avalanche Towers withstand small to medium avalanche forces and could be proven at this location once more. What was not clear at that time was whether the system could withstand rock fall that could reach a brutal impact due to the huge dimension of this wall with a vertical drop of 1,800 m (1.1 miles). To avoid rock fall completely by finding a protected location was not entirely possible. At least it was possible to take advantage of a big pillar, which offered a natural protection for most of the rock fall.

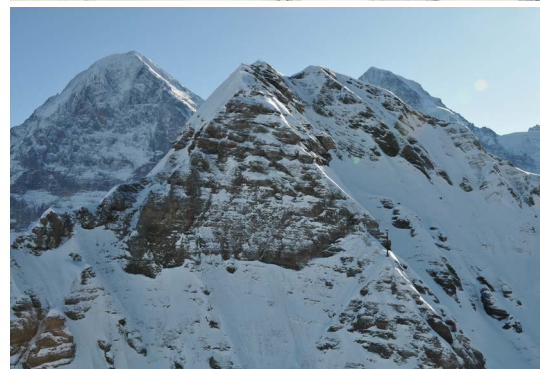
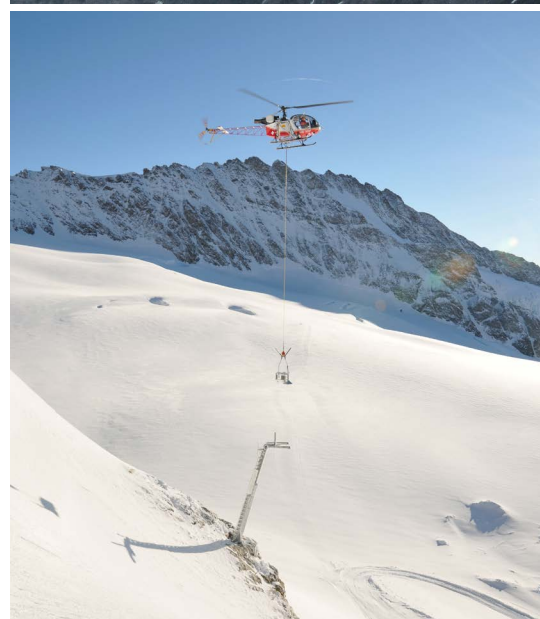
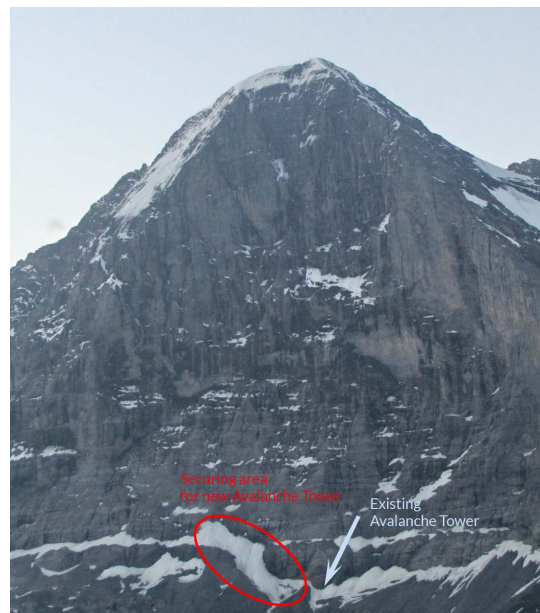
Thanks to the concept of the Wyssen Avalanche Tower, the sensitive part can be taken off and stored in a safe place in a station building. Only the mast is remaining in the endangered zone during summer when the rock fall activity is highest during summer. Another type of RACS would have been destroyed after short time already. To install sensitive supply lines or larger equipment would have been not reasonable.

Due to the chosen location beneath the protecting pillar, the area to place the anchorage was rather limited and obviously steep and exposed. The place was also under a small ledge, which meant an extra back anchorage was needed half way up the mast to withstand higher forces coming from rock falls and avalanches. Thus, a special fixture had to be manufactured and installed. The Department for Natural Hazards of the Canton of Berne carried out the construction work. The team around Toni Wyss did this challenging job excellently, way with the needed talent for improvisation and alpine experience.

Solar panels need the sun to do what they are supposed to

The next challenge was to install a power supply, because in the shade of the mighty Eiger North Face the solar panels would not see a single sunbeam for at least three month per year. With the conventional power supply, this was not possible. To bridge over the winter months, additional batteries had to be installed in the deployment box. In addition, the power-saving modus had to be used consistently. This meant that the person responsible for safety in Hansruedi Burgener's team had to make contact with the installation prior to a planned blasting during one of these time slots in order to switch it on to standby.

A second Avalanche Tower was installed in the Eiger North Face in 2016 to protect another short section along the railway from Grindelwald to Kleine Scheidegg which could be reached by an avalanche, although much less frequently. Finding the right position for this new location is much easier than the first one. There is a cliff, located approx. 50 m (164 ft) off the wall, which gives a great place for building an anchorage and appears to be quite safe from rock falls and avalanches.





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