



Risk analysis for a railway station in the Gastein valley, Austria

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Avalanches are a big challenge for the operators of traffic infrastructure in the Austrian Alps: their release can be spontaneous and therefore only hardly predictable, good solutions for an appropriate calculation of the run-out distance are still in development and the overall protection for the infrastructure can be gained only by expensive technical structures. A case study of the railway station Böckstein in the Gastein valley, Austria, which is endangered by the Feuersang avalanche, is presented.

Since the opening of the railway in 1905 avalanche defence structures have been constructed in the release area of the Feuersang avalanche. Different types of technical structures such as snow bridges, stone walls or avalanche retarding cones are combined with afforestation measures near the timberline. Subsequently, risk analyses have been carried out based on different avalanche scenarios. First, the meteorological conditions in the release area have been investigated and several release scenarios have been proposed. Second, numerical simulations of the Feuersang avalanche have been carried out. The predicted avalanche flow pressures and heights of deposits in the area of the railway station Böckstein have been used as input parameters for the assessment of vulnerability. The values at risk have been deduced separately for buildings, mobile values and persons. Third, the risk for each scenario has been calculated based on the general avalanche hazard level and the proposed risk scenarios.

The study aims at an enhanced level of safety for commercial and passenger traffic on railway lines, in particular during the winter season. According to this needs for the Austrian railways future scenarios for technical measures in the release area and in the

run-out area will be discussed.