The rock slope instability at Tytefjellet in Vindafjord, Norway. Morphologic and structural characterization.

Ø. Rem*, R.L. Hermanns

*Norwegian University of Science and Technology (NTNU), Dept. of Geology and Mineral Resources Engineering, Sem Sælands veg 1, 7491 Trondheim, NORWAY. (*correspondence: oyv-inrem@stud.ntnu.no)*

The Tytefjell unstable rock slope is located on the west side of Vindafjord, Rogaland (Southwestern Norway). Tytefjell lies on a ENE-facing slope composed of phyllites. The unstable slope extends in W-E direction from the top of the slope at 500 m above sea level down to the fjord over a distance of 1,2 km and 2,5 km N-S resulting in an area of 3 km^2. The unstable rock slope shows high rockfall activity at the frontal limit in the northern sector. Two bigger rockfall events have occurred there in the last 15 years. In 1999, a rockfall resulted in a displacement wave that caused damage on a boat and equipment lying at a fish farm 450 meters from the impact area. A smaller event occurred two years later

The rock-slope deformation at Tytefjell is characterized by a prominent 2 to 15-meter-wide, N-S oriented back crack that extends approx. 700 meters along the upper limit of the instability. Lenses of graphite with a thickness up to 0.5 meters are identified along the N dipping foliation at most locations. In the northern sector rock deformation increases towards east along two pronounced lineaments, and results in areas with higher degree of fracturing closer to the fjord.

The structural analysis revealed four steep joint sets: J1 striking SSW-NNE, J2 striking NNW-SSE, J3 striking E-W and J5 striking N-S, and in addition J4 with an average orientation of 063/43. The metamorphic foliation scatters between N and E dipping with an average orientation of 003/21. Measured crack orientation on the DEM indicates that opening mainly follows J1, J2, J4 and J5.

Future goals of this study is to perform a hazard assessment of the site following the Norwegian system for hazard and risk classification for unstable rock slopes.