



DMS monitoring for early warning at the Åknes rockslope failure, western Norway

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The D.M.S.'s continuous monitoring is part of the Åknes/Tafjord project for the integrated handling of the early warning system in the municipalities around Storfjorden in western Norway. The DMS Åknes monitoring systems were installed in two 200 m long boreholes in september and november 2006. The DMS column are made up of 50 multiparametric modular units (total length = 50 m) which are connected by joints and at the top by special lengthening extensions to adapt the installation at different depths as defined in the project. The multi-parametric in-place instrumentation allows for the contextual control of both the displacements of rock along multi-sliding surfaces, as well as the variations of the level of the water table and temperature and continuously acquires and sends data in order to obtain detailed information on the stability at defined depths. The tele-transmission of the data is carried out through the use of the GSM and dedicated software, which is installed onto a remote control server. The control unit provide 1 value/hour for each sensor updating the database. The control unit was programmed for the management of a series of alarms in 3 level incremental order for pitch axis, roll axis and water table. These were set up with a dispatching of SMS messages to the available personnel, and the reading of the data is in a continuous mode for the warning system. In the preliminary results of data analysis DMS columns show a good behaviour in system stability in both the boreholes (i.t.s., on-off). The DMS data will be a key for the understanding of the geological and kinematic model.