Šance-Řečica (Czech Republic) Landslide Monitoring Using Measurand ShapeAccelArray and Vista Data Vision Vizualisation Software

In October 2014 we installed our first ShapeAccelArray (SAA) sensor produced by Mesurand, Inc., Canada (www.measurand.com) to monitor the Šance-Řečica Landslide. After half year of use we would like to share our experience we obtained and that positively surprised us.

The SAA is built from rigid 30 or 50 cm long segments - tubes separated by flexible joints. Triaxial MEMS gravity sensors measure tilt in each individual segment. SAAs produce data equivalent to inclinometer data. Each SAA is a fully-calibrated measuring instrument with a length of up to 100 meters, delivered on a reel, and installable in very small diameter casing. As a result, installation is rapid and lower in cost, and much larger deformations can be monitored.

We installed the SAA to 1" I.D. PVC tube and chose 6 meters long sensor with 20 segments 30 cm long each. Deformations are measured automatically with Campbell Scientific CR800 datalogger, data are collected by a server via GPRS modem and are displayed in the Internet in Vista Data Vision software.

The SAA installation next to the former inclinometer borehole IV306

We have chosen the place of installation 50 cm next to the spot where the former inclinometer borehole was placed. The old inclinometer borehole has been already sheared off. We knew the depth of shearing zone from the inclinometer mea-

surements we made (Fig.1) and decided to install the SAA directly to the shearing zone with some overlap up and down. We set the SAA to the newly drilled borehole to the zone from 13.6 to 19.7 meters under the surface.
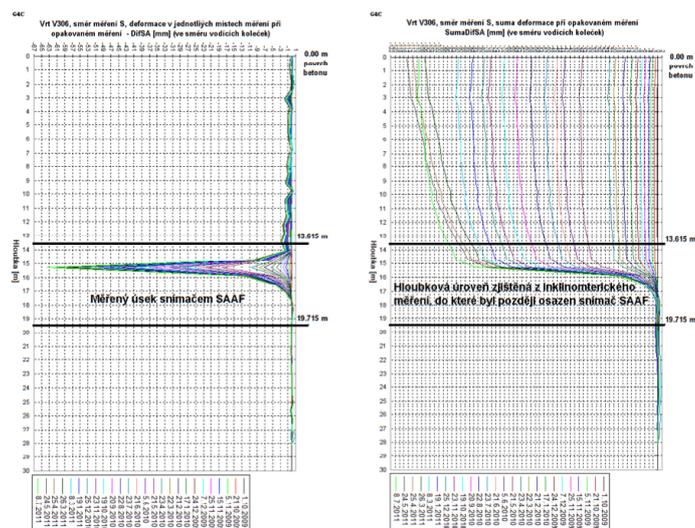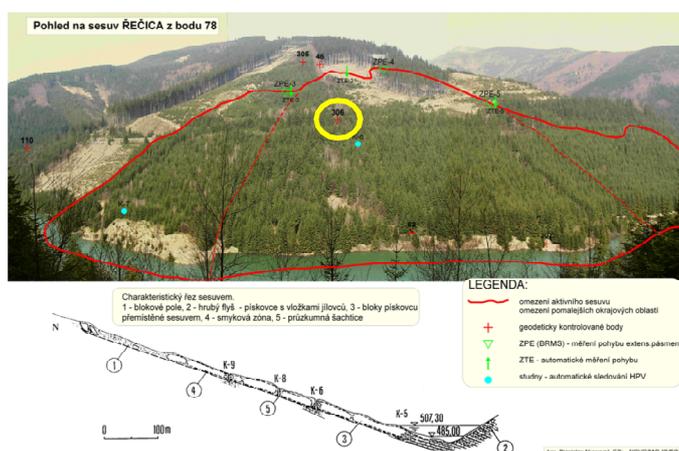

Fig.3 - 6 meters long SAA sensor (20 segments)

Automatic measurement of the slope movement

After SAA installation the borehole was grouted. The SAA was connected to Campbell Scientific CR800 datalogger that is charged from solar panels Fig.4. The datalogger communicates via GPRS modem with the server based in a professional backed up server center. Scan interval is now set to one hour and measured data are collected automatically by the server.

Fig.1 - Inclinometer measurents results

Fig.2 - SAA position (yellow circle)

Fig.4 - Solar panels that supply the datalogger through battery

Mesurement results vizualisation in the Internet with Data Vista Vision software

We have decided to use Vista Data Vision (VDV) software to prepare vizualisation of measured data. This decision was quite simple because:
- we have been using VDV for another projects
- we were trained in using VDV in VDV office in the Iceland
- VDV offers a module to display results from SAA sensors and displacement graphs

VDV also offers other features as setting alarms that are sent via e-mail or SMS when your data crosses the limits, VDV can guard if your data are up to date and send you an e-mail when not. The client can watch the results/graphs at his smart phone. Through VDV the user/client has an approach to the measurements from any part of the world where the Internet connection is reachable.

Bellow you can look at some samples of the VDV screens. Data displayed has been measured in the period from October 14, 2014 to May 25, 2015. The user/client can get to the measured data after inserting "User name" and "Password" at the welcome screen (Fig.5)
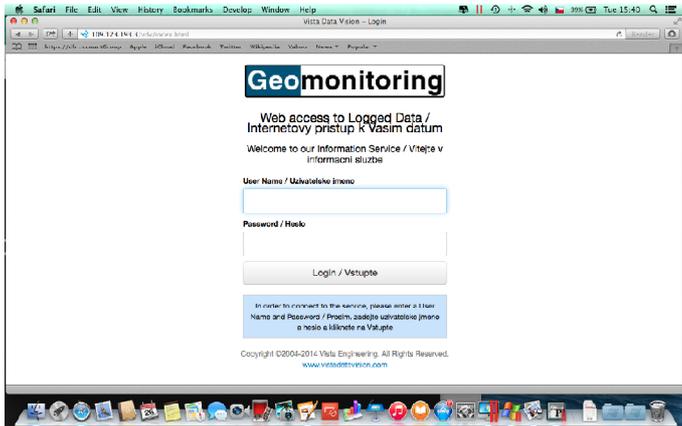

Fig.5 - "Welcome Screen" User/client must enter "User name" and "Password" to enter data vizualisation
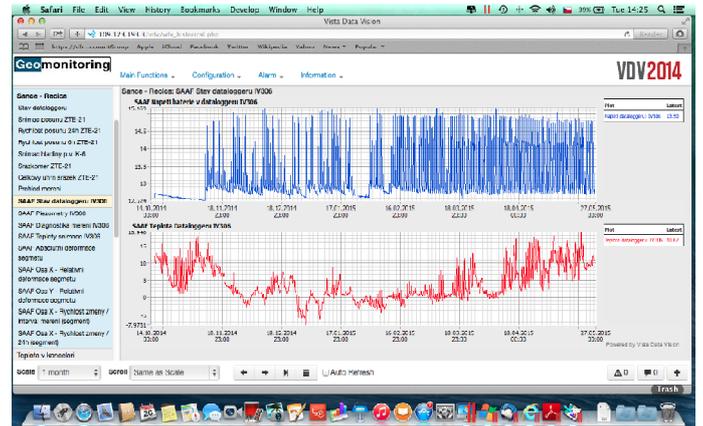

Fig.6 - "Historical Data" Datalogger power supply by Solar panel (blue graph) and Temperature of datalogger (red graph)
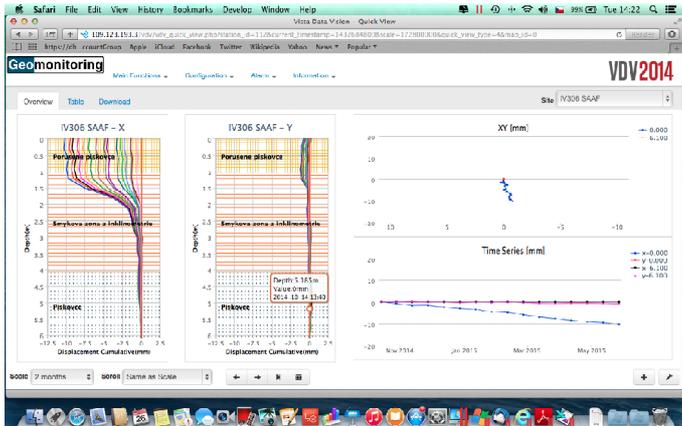

Fig.7 - "Quick View" Cumulative Displacement of the SAA sensor profile in both directions (+X to the North)
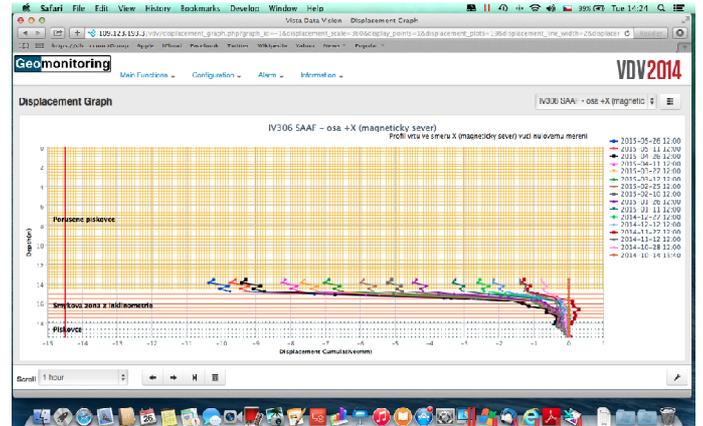

Fig.8 - "Displacement Graph" Cumulative Displacement in the X direction in the real depth under the surface
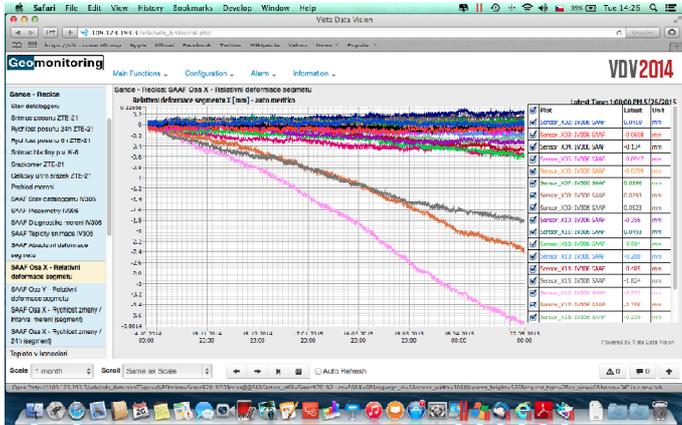

Fig.9 - "Historical Data" Horizontal deformation of each SAA segment - total 20 segments. Visible movement mainly in three segments

Fig.10 - "Historical Data" Rate of Change (RoC) in 24 hours interval at each segment. Horizontal lines are set alarms. Top Graph has an automatic scale, bottom one has the fix scale.

Geomonitoring