VISTA DATA VISION

# Landslide Monitoring Using Measurand ShapeAccelArray and Vista Data Vision

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**Location**
Šance-Řečica (Czech Republic)

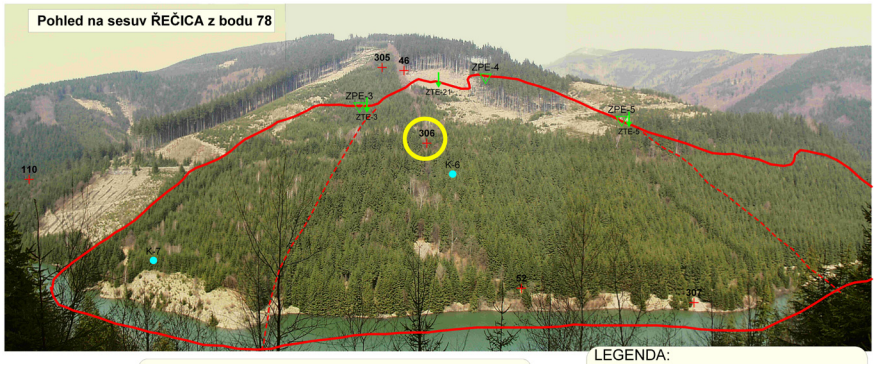
## Introduction

In October 2014 we installed our first ShapeAccelArray (SAA) sensor produced by Mesurand, Inc., Canada (www.measurand.com) to monitor the Šance-Rečica Landslide.
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.

A 6m long SAA was installed in 1" I.D. PVC tube, 20 segments 30 cm long each. Deformations are measured automatically with Campbell Scientific CR800 datalogger, data are collected by a server via GPRSmodem and are displayed in the Internet in Vista Data Vision.

## The SAA installation next to the former inclinometer borehole IV306

It was decided to place the SAA 50 cm next to the former inclinometer borehole. The old inclinometer borehole has been already sheared off. We knew the depth of shearing zone from the inclinometer measurements we made and decided to install the SAA directly to the shearing zone with some overlap up




*SAA position (yellow circle)*

*6 meters long SAA sensor (20 segments)*

*Solar panels that supply the datalogger through battery*

and down. We set the SAA to the newly drilled borehole to the zone from 13.7 to 19.7 meters below the surface.

### 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.3. 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.

### Measurement results visualization in the Internet with VDV

We decided to use Vista Data Vision (VDV) software to prepare visualization of measured data. VDV offers a module to display results from SAA sensors and displacement graphs. We have also used VDV for another projects.

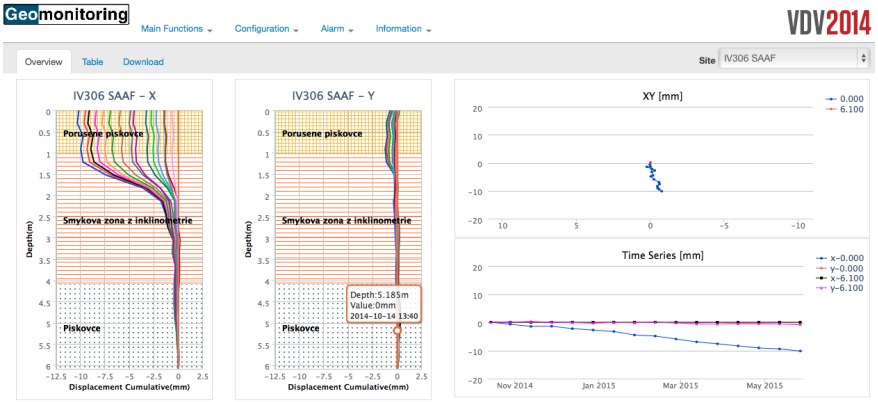
VDV also offers other features as setting alarms that are sent via e-mail or SMS when your data crosses the limits.

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.

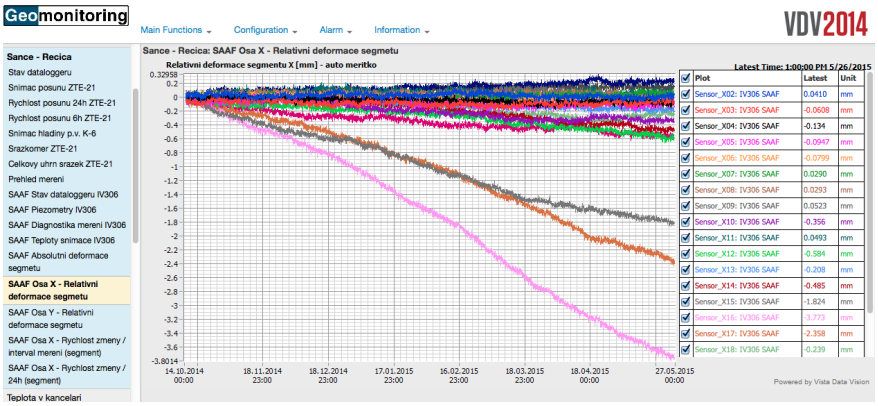
Through VDV the user/client can access the measurements from any part of the world where the Internet connection is reachable.

### Conclusion

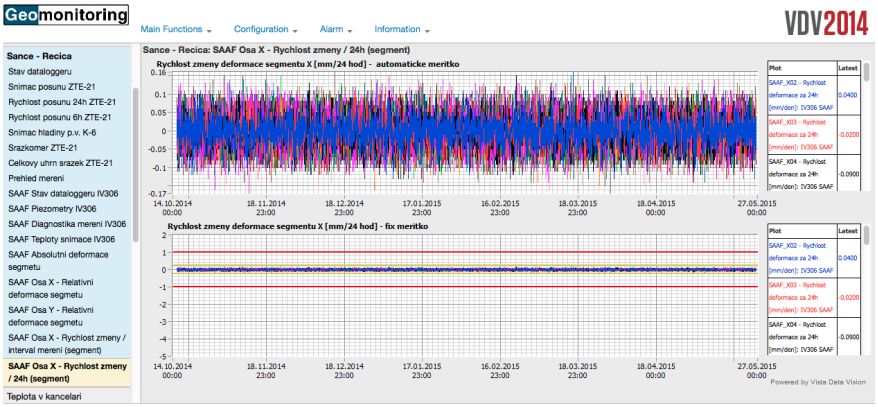
The client was satisfied that the landslide movement was being watched automatically. Client appreciates to have access to measured data and graphs from any device (PC, Smart Phone, Tablet) from any location through the Internet.



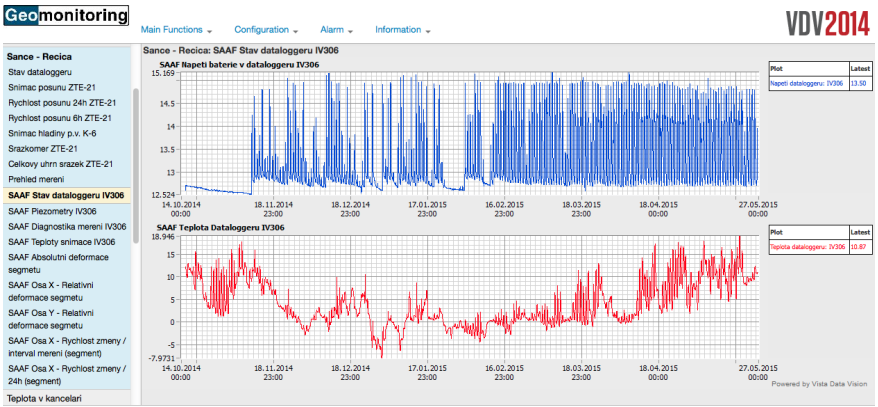

*Cumulative Displacement of the SAAsensor profile in both directions (+X to the North)*




*Horizontal deformation of each SAA segment. Visible movement mainly in three segments*




*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.*




*Datalogger power supply by Solar panel (blue) and Temperature of datalogger (red)*

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