GeoWatch

March 2008, Issue 35

Table of Contents

- Keynote:.....1
- Seismic Monitoring Network for Lentini Dam, ITALY 1
- New Employees: Sabrina Bolliger & Yesim (Alpay) Biro.....2

Keynote:

Scope:

GeoSIG has deployed a new state of the art seismic monitoring network in Sicily, Italy for the Lentini Dam, which is in a seismically very active area. This demonstrates some of the outstanding capabilities of GeoSIG systems as well as the latest GeoDAS - SEISAN interface. As usual for any further detailed information, we are always glad to respond back any relevant inquiry through our contact channels. We also continue to present our new employees in this issue, with whom we are broadening our resources and horizons.

Seismic Monitoring Network for Lentini Dam, ITALY

Lentini is a town with about 24'000 people in the south-east of Sicily, part of the province of Syracuse. Beside other agriculture there is an enormous amount of orange trees in this region. To cover the water demand, the water is collected and stored in an artificial lake with an embankment dam next to the city.

Seismic Monitoring Network:

Lentini is close to the border of the Eurasian- and African tectonic plates, where a complex system of faults exists. Small magnitude earthquakes happen almost every day and even larger ones around the magnitude of 6.5 are possible.

Next to the existing dam monitoring system, GeoSIG built a new state of the art seismic monitoring network. Five Field Stations are located on selected sites around the Lentini Dam (Figure 1).

From these five Field Stations the seismic data of vertical short period seismometers are sent to the Central Station by telemetry. Additionally one triaxial short period seismometer is located at the Central Station.

The network has been designed, to analyse data in a very short distance to the dam, < 5 km. The seismic monitoring network is also able to record earthquakes from all over the world, but because of the small size of the network, earthquake locating precision is reduced.

Figure 1. Overview, created by Google Earth

Every Field Station is powered by a unique solar panel or - in case of bad weather conditions - by battery. A solar charger takes care about the charging of the battery and controls, whether the equipment is powered by solar panel or battery. Depending on the actual situation, it automatically switches between these sources without any interruption. With a safety factor of 2.0, the system still guarantees three days continuous running without any sun.

Inside the building, the vertical short period the CMG-40V-1 sensor is connected to a GSD-24 digitiser. The digitizer streams the data via the telemetry unit to the Central Station. The data are time stamped on the basis of the GPS, which is installed on the roof of each Field Station and connected to the GSD-24 as well.

All Field Stations are carefully protected against over voltage and lightning, and therefore ensure a long lifetime even during bad weather conditions.

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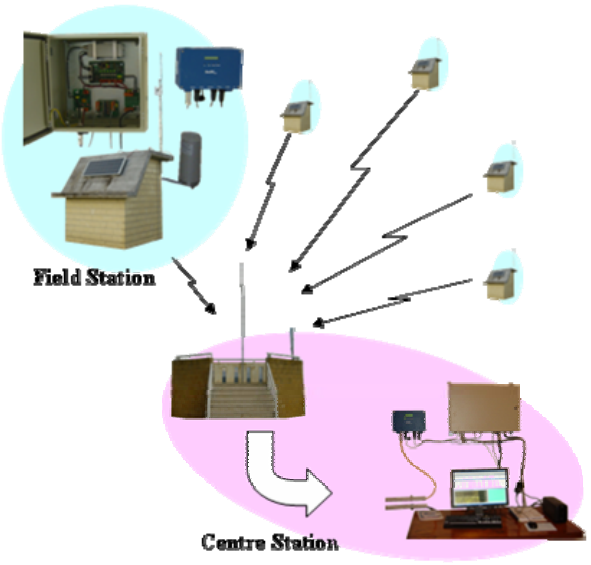

Figure 2. Seismic Monitoring Network Overview

The data from all Field Stations and the data from the local triaxial seismometer at the Centre Station are forwarded to a communication unit, which is connected to the data acquisition computer. The acquisition of the data is done by the powerful GeoSIG Data Acquisition System software, GeoDAS. In case of any changes or problems, all Field Stations can be configured from the centre also by GeoDAS. Seismic events will be detected by advanced network triggering and STA/LTA calculations. In case of an event, the data will be stored and automatically forwarded to SEISAN database for further analysis. SEISAN is then able to post process large data sets. Thanks to the close relation of GeoDAS and SEISAN, the user has a simple and powerful tool for analysing the recorded data; received from the precise Seismic Monitoring Network around the dam of Lentini.

Service:

This system has been supplied in close coordination with Pizzi Instruments, our representative in Italy. They are instrument makers and providers of technical assistance and service for instruments and systems to monitor dams and large structures and constructions of civil and historical interest.

Within the context of the project, SEISAN Database Training Workshop was performed by Prof. Jens Havskov from the Department of Earth Science at the University of Bergen for 10 people in Lentini, Italy during 18-20 February, 2008. The training workshop consisted of:

- General knowledge about seismic events
- General knowledge about SEISAN
- Training with some test data and events
- Personal and detailed training of the staff that will use SEISAN while operating the Seismic Monitoring Network.

Figure 3. Locating of an event

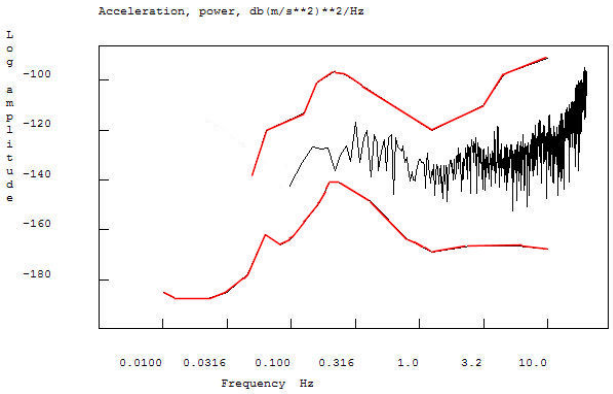

Figure 4. Peterson Noise Curve of a Field Station

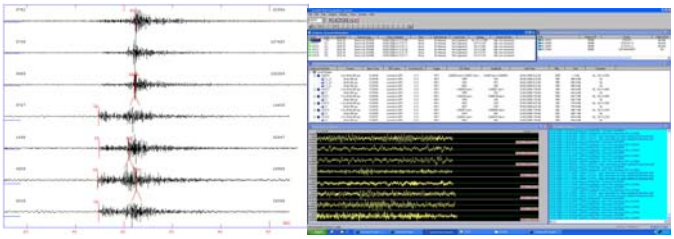

Figure 5. Data analysis by SEISAN and GeoDAS

New Employees: Sabrina Bolliger & Yesim (Alpay) Biro

We welcome our new employees in the GeoSIG team, Sabrina Bolliger and Yesim (Alpay) Biro.

Sabrina Bolliger joined in our team as an Executive Assistant and Marketing & Sales Assistant. She is preparing quotations, organising shipments and several administrative matters.

Ms. Bolliger has made a commercial apprenticeship with the Swiss Local Government in Kölliken.

She is also a member of the YMCA Scout of Entfelden where she leads a group of 15 children.

Yesim (Alpay) Biro joined in our team as a Marketing & Sales Assistant, preparing proposals, tender and project evaluations as well as technical reference documentation.

Mrs. Biro holds a M.Sc. degree in Civil and Earthquake Engineering and is specialised in several topics of earthquake engineering applications.

She has work experience as an expert in scientific institutions as well as in commercial companies.

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