Case Study

Dam Monitoring
Baixo Sabor Complex Dams
Bragança, Portugal

GeoSIG
swiss made to measure

In Cooperation With GeoSIG Partner

vórtice
Equipamentos Científicos, Lda.

Background

Field works for the Baixo Sabor Complex in Bragança, Portugal, started in 2008, with production beginning in 2016. There are two dams and a hydroelectric power station located in the Sabor River. They can generate 189 MW of power, with annual average production of energy at 460 GWh (230 GWh net). The reservoir created by the upstream echelon stretches over 60 km, and the reservoir created by the downstream echelon is about 9.6 km in length. This reservoir more than doubles the storage capacity of Portuguese water in the Douro River.

Challenge

The project is the largest recent power generation project in Portugal. The complex is designed to provide 20% of the nation's energy reserve and to provide support for other hydroelectric power plants. It is located in an area of special historical and environmental interest. One aspect of monitoring required for the complex is a Seismic Observation System.

Solution

Such an important project required a respected company with vast experience in the field. Vórtice Equipamentos Científicos, Lda. – a GeoSIG Partner for more than 20 years – designed a custom seismic observation system for the Baixo Sabor Complex in four parts.

The **Free Field Sub-System** included six remote stations with triaxial accelerometer, a solar panel power solution (400W – 400 Ah batteries), 3G remote communications (fixed ip), and was GPS referenced. The **Upstream Dam Sub-System** included five + one (master) stations with triaxial accelerometer, a fibre optics network connection, and was GPS referenced (master).

The **Downstream Dam Sub-System** comprised one + one (master) stations with triaxial accelerometer, a fibre optics network connection, and was GPS referenced (master). The **Central Processing System** included a desktop computer with UPS, GeoDAS DBS software and SEISAN software.

The seismic observation system provides automatic detection and central registry of events. It features automatic delayed upload of seismic data to the central processing unit, and automatic determination of location of seismic events. It also allows for broadcast alert of seismic events.

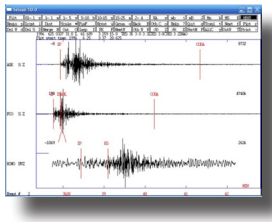
Another Solution using GeoSIG instruments and a capable Partner effectively showing that quality and reliability can also be cost-effective.

Product links

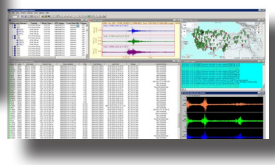
AC-73 accelerometer
GMSplus
GeoDAS software
SEISAN software

AC-73 accelerometers

GMS^{Plus}



SEISAN software



GeoDAS software

Above and below: The Baixo Sabor Complex Dams in Bragança, Portugal.

Free Field Station.

Dam Station — a high humidity area.

Fibre Optics at Upstream Dam.