



System of Earthquakes Alert (SEA) on the territory of Bulgaria developed as a result of DACEA project

Dimcho Solakov, Liliya Dimitrova, Stela Simeonova, Irena Aleksandrova, Stoyan Stoyanov, and Metodi Metodiev
National Institute of Geophysics, Geodesy and Geography - BAS, Sofia, Bulgaria (lidimitrova@yahoo.com)

The prevention of the natural disasters and the performing management of reactions to crisis are common problems for many countries. The Romania-Bulgaria border region is significantly affected by earthquakes occurred in both territories: on the one-hand, Vrancea seismic source, with intermediate-depth events and on the other hand, crustal seismicity recorded in the northern part of Bulgaria (Shabla, Dulovo, Gorna Orjahovitza).

The general objective of DACEA (2010-2013) project is to develop an system of earthquake alert in order to prevent the natural disasters caused by earthquakes in the cross-border area, taking into account the nuclear power plants and other chemical plants located along the Danube on the territories of Romania and Bulgaria. An integrated warning system is designed and implemented in the cross-border area. A seismic detection network is put in operation in order to warn the bodies in charge with emergency situations management in case of seismic danger. The main purpose of this network is:

- monitoring of the four seismogenic areas relevant for the cross-border area, in order to detect dangerous earthquakes
- sending the seismic warning signals within several seconds to the local public authorities in the cross-border area

On the territory of Bulgaria the seismic network belonging to SEA is consists of:

- 8 seismic stations equipped with Basalt digitizer, accelerometer Epi-sensor and BB seismometer KS2000.
- 8 seismic stations equipped with Basalt digitizer, accelerometer Epi-sensor, warning and visual monitoring equipment.

The stations are spanned allover the North Bulgaria. The sites were thoroughly examined and the most important requirement was the low level of noise or vibrations. SEA centers were established both in Sofia (in National Institute of Geophysics, Geodesy and Geography - NIGGG) and Bucharest (in National Institute of Research and Development for Earth Physics). Both centers are equipped with servers for data analyses and storage. Specialized software for elaboration of scenarios of seismic hazard is designed and implemented. The reaction of buildings, roads, bridges, land etc. to earthquakes is graphically shown on the monitor. The high risk areas are highlighted in order for the emergency units to be prepared for intervention. This software is designed on the base of a comprehensive relational data base of historical and contemporary seismicity in the cross-border region. The output shake maps and scenarios are to be used by the emergency intervention units, local public authorities and for general public awareness.