



## **Automatic data processing and analysis system for monitoring region around a planned nuclear power plant**

Timo Tiira, Outi Kaisko, Jari Kortström, Tommi Vuorinen, Marja Uski, and Annakaisa Korja

University of Helsinki, Institute of Seismology, Department of geosciences and geography, Helsinki, Finland  
(timo.tiira@helsinki.fi)

The site of a new planned nuclear power plant is located in Pyhäjoki, eastern coast of the Bay of Bothnia. The area is characterized by low-active intraplate seismicity, with earthquake magnitudes rarely exceeding 4.0. IAEA guidelines state that when a nuclear power plant site is evaluated a network of sensitive seismographs having a recording capability for micro-earthquakes should be installed to acquire more detailed information on potential seismic sources. The operation period of the network should be long enough to obtain a comprehensive earthquake catalogue for seismotectonic interpretation.

A near optimal configuration of ten seismograph stations will be installed around the site. A central station, including 3-C high-frequency and strong motion seismographs, is located in the site area. In addition, the network comprises nine high-frequency 3-C stations within a distance of 50 km from the central station. The network is dense enough to fulfil the requirements of azimuthal coverage better than 180° and automatic event location capability down to  $\sim$  ML -0.1 within a radius of 25 km from the site.

Automatic processing and analysis of the planned seismic network is presented. Following the IAEA guidelines, real-time monitoring of the site area is integrated with the automatic detection and location process operated by the Institute of Seismology, University of Helsinki. In addition interactive data analysis is needed. At the end of year 2013 5 stations have been installed. The automatic analysis utilizes also 7 near by stations of national seismic networks of Finland and Sweden. During this preliminary phase several small earthquakes have been detected. The detection capability and location accuracy of the automatic analysis is estimated using chemical explosions at 15 known sites.