



A novel mobile system for radiation detection and monitoring

Mauro Biafore and the REWARD (www.reward-project.eu) Team

Regione Campania - Centro Funzionale Multirischi

A novel mobile system for real time, wide area radiation surveillance has been developed within the REWARD project, financed within the FP7 programme, theme SEC-2011.1.5-1 (Development of detection capabilities of difficult to detect radioactive sources and nuclear materials - Capability Project). The REWARD sensing units are small, mobile portable units with low energy consumption, which consist of new miniaturized solid-state radiation sensors: a CdZnTe detector for gamma radiation and a high efficiency neutron detector based on novel silicon technologies. The sensing unit is integrated by a wireless communication interface to send the data remotely to a monitoring base station as well as a GPS system to calculate the position of the tag. The system also incorporates middleware and high-level software to provide web-service interfaces for the exchange of information. A central monitoring and decision support system has been designed to process the data from the sensing units and to compare them with historical record in order to generate an alarm when an abnormal situation is detected. A security framework ensures protection against unauthorized access to the network and data, ensuring the privacy of the communications and contributing to the overall robustness and reliability of the REWARD system. The REWARD system has been designed for many different scenarios such as nuclear terrorism threats, lost radioactive sources, radioactive contamination or nuclear accidents. It can be deployed in emergency units and in general in any type of mobile or static equipment, but also inside public/private buildings or infrastructures. The complete system is scalable in terms of complexity and cost and offers very high precision on both the measurement and the location of the radiation. The modularity and flexibility of the system allows for a realistic introduction to the market. Authorities may start with a basic, low cost system and increase the complexity based on their evolving needs and budget constraints. On 24th September 2013, REWARD project received a prize as the best Innovative project related to the Not Conventional Threat (NCT) Chemical Biological Radiological Nuclear explosives (CBRNe) products. A highly distinguished jury stated that “the developed detection and surveillance system offers a perfect solution for end-users to enhance crucial capabilities in RN analysis, risk communication and surveillance in case of a radiation incident”. A demonstration of the REWARD system is planned in Naples on September 2014. More information about the REWARD project can be found at www.reward-project.eu.