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Preventing illicit trafficking of nuclear and radioactive material

The aim of this synopsis is preventive action aimed at the identification of illegal transportation of radioactive material. It is to be expected that smugglers will avoid border crossings and checkpoints where radioactive radiation can be detected. This work aims to create additional devices that send the status of the Personal Radiation Detector (PRD) alarm via the mobile telephony network, such enabling remote monitoring of selected locations. PRD with additional devices should be hidden at toll booths, petrol stations, traffic lights, narrow roads which are used for illegal border crossings and other places that allow slow passage of the vehicle or its stopping near the hidden detection station. This enables continuous control of a large number of vehicles, such increasing the likelihood of detection of unauthorized transport of radioactive materials. The latest generation equipment manufacturers have no PRDs that can be connected to the network of the mobile operator. On the market, there are PRD's of the latest generation that only have a bluetooth connection with a mobile phone and are designed for measurements from a distance of several meters. This paper aims to offer a technical solution in order to signal the status of the alarm sent through the network of the mobile operator. The PRD alarm signal is a light and vibration. As PRD is used as a hidden station, therefore, it is in a darkened area, the light of the display the alarm can be a trigger that will send an alert in the form of a call or SMS message to an already predefined phones whose number entered into the microcontroller.
The photo resistor is an electrical component that changes its resistance by changing the intensity of light. In this way, it is possible to detect the change of light, that is the status of the alarm on the PRD display. Vehicle identification is done by means of a camera or an existing video surveillance that is synchronized with the work of a hidden station for the measurement of radioactive radiation. Several stations on one section of the road can measure the radioactivity of almost every vehicle, with regard that the vehicle will be stopped at least one of several traffic lights.
It can also be used in conditions of illegal border roads. The system should be protected from low temperatures. Of course, this concept in one location should not have a high price, which allows covering a large number of potential illegal crossings. In these conditions, the autonomy of the work can be greatly increased, because the external batteries can be hidden, buried, which allows for a great autonomy of operation. The same system can be added to devices such as motion detectors, external cameras used by border police and hunters. Although the border can be very long, monitoring can be carried out successively. Information on threat assessments, ITDB and other information can be used in the preventive action against illegal international transit of nuclear and other radioactive material.

State

Montenegro

Gender

Male

Author: Mr PAVLICEVIC, Dragan (National Security Agency)

Presenter: Mr PAVLICEVIC, Dragan (National Security Agency)

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