Large surface detectors for the detection of illicit fissile masses and dirty explosive, Sensitivity and limits of detection

M. Huver, L. Berger

(technical director Canberra Eurisys),

Abstract

The detection of fissile mass and radioactive material in illicit traffic has been the object of intensive development these last years. Large surface detectors are now used mainly designed on the base of plastic scintillators. The use of large plastic scintillators have led to high efficiency of detection allowing the possibility to reach low detection limits in short time of measurements.

This paper presents the possibilities of the latest developments and is focused on the comparison between ideal conditions of measurement and more realistic conditions. In particular the impact of screens, matrix, shielding and mixture of radioactive material is analyzed regarding the probability of non detection and false alarm. The difficulties in differentiation of natural, medical, licit and illicit transportation is also tackled.