



Performances of scintillators applied to Special Nuclear Material (SNM) measurements in the field of Nuclear Safeguards, material verification and Nuclear Security

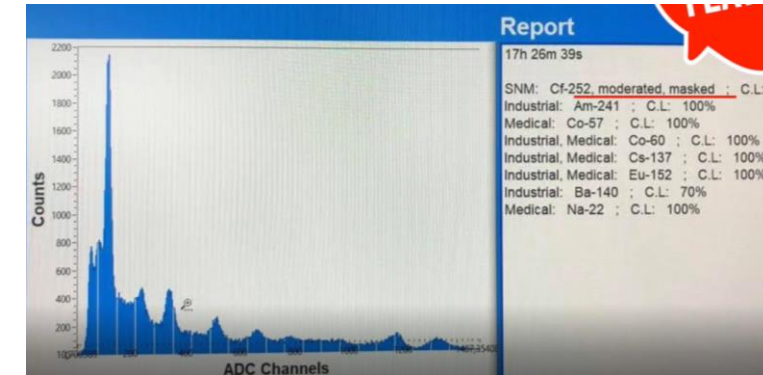
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SCENARIO:

- **nuclear threats** are still an actual problem for homeland security and for counter terrorism agency as reported by IAEA through the **ITDB** (3497 incidents from 1993 to 2018)
- **SNM out of regulatory control** can be used by terrorists to produce **dirty bombs** (conventional explosive coupled to radioactive material) to contaminate national strategic areas and to rise panic in the common people

METHOD:

- **Innovative scintillators** coupled to **digital electronics with pulse shape processing (PSP) firmware** allow to new measurements method that are step-change respect the current detection systems.
- **EJ309 liquid scintillator** is used for detect both gamma and fast neutrons (allowing energy measurement of the neutrons) with a double integration charge gate to perform **PSP**
- **CeBr₃** is used for gamma spectroscopy as a tradeoff between good resolution plus low intrinsic background and easiness of use



SOLUTION:

- **SNIPER-GN** is a Backpack Radiation Device (BRD) designed by CAEN and equipped with EJ309 and CeBr₃. It can perform gamma and neutron counting, gamma spectroscopy identification and **is the only instrument in the world that performs neutron source identification in less than 1 min through the neutron measurement**
- **SNIPER-GN patented algorithm** allows for discrimination between Cf-252, Am/Be, Am/Li, U and Pu with. In less than 1 min can also determine the **measurement condition** indicating the presence of **masking source, moderators or lead shielding**
- It exceed international standards like: IEC62327, ANSI N42.34, ANSI N42.53

