

Simulations and tools in support to reachback experts

Providing an efficient response to R/N threats is complex and highly benefits from the existence of a fully integrated nuclear and radiological detection architecture. For decades, the military division of CEA (Commissariat à l'énergie atomique et aux énergies alternatives) has been involved in operational response to R/N terrorist threats. In 2014, the French authorities entrusted CEA to develop, maintain and run the National Center for Radiological Expertise (CNER –Centre National d'Expertise Radiologique).

During a R/N event, CNER experts will provide assistance to first responders and national authorities in terms of radiation protection and perform analysis of data from spectrometric detectors, either portals or handheld detectors.

The presentation will focus on some **key support actions**, which are primordial to maintain a reachback center, such as CNER, in an operational state :

- First, to guarantee the quality of received data, which conditions the relevance of the following expertise, key actions are :
- **upstream characterization of detectors on a metrology platform** to refine technical awareness of detectors capabilities and limitations in operational contexts and to set suitable thresholds,
- **training of first responders** on data acquisition conditions.
Indeed, thresholds optimization is very important to ensure effective monitoring of the site and minimization of innocent alarms rate. Therefore, innocent alarms or radiological detection that are qualified as “normal”(natural occurring radioactive materials below an acceptable level, radiopharmaceutical at a level compatible with in vivo administration ...) do not lead to the interception of the monitored entity.
- Then, to expertise cases of complex radiological events that require high level training and experience, keys actions, such as are **development and use of reference spectrum databases, analysis tools and simulation tools**, highly benefit to CNER experts. Indeed, some R/N configurations can be reproduced on a metrology platform to acquire reference spectrum and characterize detectors performances. However, specific scenarios are impossible to reproduce with experimentations. Therefore, the creation and validation of models of detectors is essential to further characterize detectors responses and enrich a reference spectrum database.

To illustrate the importance of these simulations and tools in support to reachback experts, the methodology used to create and validate models of large volume detectors will be presented through the example of one specific detector. Then, a set of R/N event expertises, based on real data from the system deployed in Le Havre harbor, will be detailed to highlight the contribution of those models to the expertise of reachback center experts.

Gender

Female

State

France

Authors: PETITGUILLAUME, ALICE (CEA); Mr VAYRE, Sylvain (CEA); Mr MASSE, Daniel (CEA)

Presenter: PETITGUILLAUME, ALICE (CEA)

Track Classification: MORC: Detection technology development and performance testing