

Stakeholder - Workshop
Testing of CBRNE detection equipments

Nov. 4.-5.th 2009; Brussels

POSSIBLE THREAD SCENARIOS INCLUDE:

- RADIOLOGICAL EXPOSURE DEVICE;
- RADIOLOGICAL DISPERSAL DEVICE;
- ATTACK ON TRANSPORT OF RADIOACTIVE MATERIAL;
- CONTAMINATION OF FOOD AND WATER SUPPLIES;
- ATTACK ON NUCLEAR INSTALLATION OR INSTALLATION CONTAINING RADIOACTIVE MATERIAL
- IMPROVISED NUCLEAR DEVICE.



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MAJOR TECHNICAL CHALLENGES:

- **DETECTION**
- **IDENTIFICATION**
- **LOCATION OF THE SOURCE.**



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EMERGENCY RESPONSE - MEASUREMENTS

dose rate, contamination , concentration of airborne radionuclides

ROUTINE EQUIPMENT USED FOR EMERGENCY RESPONSE INCLUDES:

- Geiger-Müller detectors (exposure rate, beta dose rate, contamination);
- Ionization chambers (exposure rate, beta dose rate);
- Proportional counters (contamination, neutron dose);
- Scintillation detectors (exposure rate, alpha and beta contamination, ground deposition, concentration in air, nuclide identification);
- Solid state detectors (exposure rate, ground deposition, concentration in air, nuclide identification).



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EMERGENCY RESPONSE - MEASUREMENTS

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personal
alarming
dosimeters



personal passive dosimeters



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EMERGENCY RESPONSE - MEASUREMENTS

dose rate, contamination , concentration of airborne radionuclides



Personal Radiation Detectors (PRDs).



beta and X-ray contamination monitor

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EMERGENCY RESPONSE - MEASUREMENTS

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An example of alpha, beta and gamma contamination monitoring action

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FOUR KINDS OF PROFESSIONAL TESTS

- 1. Sensors tests of using in CLOR certified laboratory equipped with walk-in radon/aerosol chamber.**



AP 101



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FOUR KINDS OF PROFESSIONAL TESTS

1. Sensors tests of using in CLOR certified laboratory equipped with walk-in radon/aerosol chamber.

The aerosol conditions in the chamber can be altered as required for studies and calibrations using the TSI water aerosol generator to raise an aerosol level or running of air conditioning engine to lower an aerosol level. The concentration of neutral condensation nuclei is measured by an American condensation nuclei monitor RICH 100. The concentration of potential alpha energy (PAEC) in the chamber and the distribution of size of particles-carriers of radon progeny are continuously monitored by means of Radon Progeny Particle Size Spectrometer (RPPSS) from ACJ&Associates, The chamber contains a radon atmosphere which can be varied from several Bq/m³ to ca. 52000 Bq/m³. Radon is delivered from two dry Pylon radium-226 sources, traceable to NIST standards and its concentration is continuously measured by means of one of two AlphaGUARD monitors.

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2. Unique sensor test against ^{131}I , $^{99\text{m}}\text{Tc}$ beta particles and gamma emitters in Radioactive Iodine Laboratory.

The test will check the sensors performance for both aerosol and elemental forms of airborne radioiodine occurrence. Contaminant air concentrations will be controlled with adequate accuracy by gamma spectroscopy measurements of charcoals filters.



AB 450

The Laboratory for monitoring of radioiodine in thyroid for population in emergency situation



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FOUR KINDS OF PROFESSIONAL TESTS

- 3. Unique sensors test in Radiochemical Laboratory for Identification and Analysis of Seized Nuclear Material and Radioactive Sources against plutonium (Pu-237) alpha particles. The concentration of radioactive aerosol is determined by radiochemical method**



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FOUR KINDS OF PROFESSIONAL TESTS

4. Testing and calibration of various type of external exposure sensors (Personal Radiation Detectors (PRDs) in X , α , β , γ fields by accredited Secondary Standard Laboratory.



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Calibration Laboratory

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