Airborne measurements in post-accident management: the Belgian experience

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In Belgium, the emergency preparedness and response in case of a nuclear or radiological emergency has been laid down in the Royal Decree of March 1st 2018. It has been written under the form of a framework plan that outlines the responsibilities, structures and governing principles, and allowing for a flexible and adaptive organisation in the field.
The coordination of radiological and nuclear emergency planning and response is performed by the National Crisis Centre (NCCN), an administration under the Ministry for the Interior. Within the Decree, coordination of scientific and technical responsibilities is given to the Federal Agency for Nuclear Control (FANC) which unites the other partners involved - among which the nuclear operators, scientific institutes (SCK CEN and IRE), Defense and Civil Protection – in an evaluation cell and a measurement cell.
During the post-accidental phase, the goals of measurements in the characterization and evaluation of the environmental situation partly shift from direct protective actions and validation of dispersion towards a more global overview of the contamination which allows for a medium to long-term strategy of crisis management (food safety, environmental processes and remediation).
An integrated measurement strategy using air-borne methods* allows for a more efficient guidance of field measurements. To map the initial contamination in the aftermath of an accident, aerial gamma spectrometry is used with helicopters carrying large volume scintillation detectors. As an integral part of different emergency exercises the main Belgian nuclear installations and their surroundings have been surveyed in the last years. In parallel, R&D on the use of Unmanned Aerial Vehicles (UAVs) and their integration in the monitoring strategy has been initiated. Different drone-detector combinations have been tested over historically contaminated areas in a collaboration with the Belgian Civil Protection and a demonstration project, the Belgian Unmanned aerial systems for Decommissioning, Detection and AWAreness of radioactive risK (BUDDAWAK), in which long endurance fixed wing and large multi-copter drones are equipped with optimized detection systems, is currently running. Long-term follow-up of contamination levels in a reproducible way and detailed mapping for guiding remediation actions in the post-accidental phase are challenges UAVs can largely contribute to.

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