

Novel Technologies for Safeguards

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ABSTRACT

The International Atomic Energy Agency (IAEA) Novel Technologies Project is providing access to a wider range of methods and instruments, as well as establishing a systematic mechanism to analyse gaps in the inspectorate's technical support capabilities. The project also targets emerging and future inspectorate needs in the areas of verification and the detection of undeclared nuclear activities, materials, and facilities, providing an effective pathway to technologies in support of safeguards implementation.

The identification of safeguards-useful nuclear fuel cycle (NFC) indicators and signatures (I&S) is a fundamental sub-task within the Project. It interfaces with other IAEA efforts currently underway to develop future safeguards approaches through undertaking an in-depth review of NFC processes. Primarily, the sub-task aims to identify unique and safeguards-useful "indicators", which identify the presence of a particular process, and "signatures", which emanate from that process when it is in operation. The matching of safeguards needs to detection tool capabilities facilitates the identification of gaps where no current method or instrument exists. The Project has already identified several promising technologies based on atmospheric gas sampling and analysis, laser spectrometry and optically stimulated luminescence. Instruments based on these technologies are presently being developed through support programme tasks with Member States.

This paper discusses the IAEA's project, *Novel Technologies for the Detection of Undeclared Nuclear Activities, Materials and Facilities* and its goal to develop improved methods and instruments. The paper also describes the method that has been devised within the Project to identify safeguards-useful NFC I&S and to determine how the sub-task interfaces with other IAEA efforts to establish emerging safeguards approaches. As with all safeguards-targeted research and development (R&D), the IAEA depends enormously on the continuing support of its Member States to provide guidance, funds and expertise. Cooperation with Member States remains a critical factor in ensuring the availability of effective and efficient methods in support of safeguards implementation.