New technology for nuclear detection

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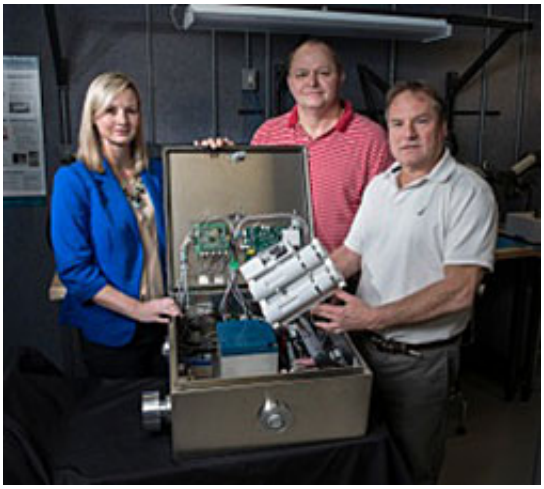

The Tri-Ace particle collector with developers Lindsay Sexton, Timothy Riley and Daniel Radford.

A new device created by researchers at the Savannah River National Laboratory (SRNL) and Oak Ridge National Laboratory is able to immediately collect airborne particles to help determine if radioactive isotopes are present. This device could prove to be a valuable asset to organizations responsible for monitoring nuclear activities worldwide.

The Tamper Resistant/Tamper Indicating Aerosol Containment Extractor (TRI-ACE) is about the size of a small cooler and can collect particles such as plutonium, uranium, and other nuclear material in the air before it is able to settle on a surface. It's also able to clearly demonstrate if anyone tries to interfere with the sampling. The TRI-ACE

offers constant, unattended collection, flags abnormalities, and collects material that may be used to indicate if illegal nuclear activities have taken place at a facility.

"The TRI-ACE automated particle collector will help gather airborne particles of importance to nuclear safeguards and nonproliferation," said SRNL Senior Scientist Lindsay Sexton. "The instrument has the potential to indicate undeclared production of nuclear material, which would be of great benefit to the safeguards community."

The collection tube is surrounded by multiple layers of tamper-resistant and tamper-indicating features, allowing it to be left unattended and still do the job. This is a significant improvement over current international methods used for detection. One way the International Atomic Energy Agency collects environmental samples is by manually swiping surfaces with a cotton cloth. Since the TRI-ACE collects samples automatically, this means inspectors will spend less time in the field, saving time, money, and risk of exposure. Continuous collection would also improve the probability of detecting undeclared activities.

With more and more countries expressing interest in nuclear power, the monitoring workload is expected to increase. Technologies are needed to help inspectors work more efficiently to maintain or even improve the high quality of safeguards inspections. Funding for this project was possible through the National Nuclear Security Administration's Office of Nonproliferation Research and Development, and Office of Nonproliferation and Arms Control.

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