



# Archived Content

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# Advanced Technology Demonstrations

## Advanced Technology for Radiological and Nuclear Detection

The Advanced Technology Demonstration (ATD) program performs accelerated development, characterization, and demonstration of leading-edge technologies that address critical gaps in radiological and nuclear detection capabilities. ATDs build on technology concepts previously demonstrated under the Domestic Nuclear Detection Office's (DNDO) Exploratory Research (ER) program, conducted by DNDO's interagency partners, or based on privately funded research efforts. Through the ATD, concepts are developed into prototype systems called Performance Test Units that provide reliable and scalable performance measurements in a simulated or controlled operational environment. Using this technology characterization process, sufficient understanding of the technology is obtained to recommend a technology transition path to a government acquisition program, commercial system development, or additional basic and applied research.

### Radiation Awareness and Interdiction Network

**(RAIN), FY13-present:** Looks at the benefits of fusing radiation detection data with other sensor data (video) to detect, localize, and track radiation sources in motion. It will leverage recent technology advancements made through DNDO's ER program and the LRRD ATD. The development and characterization of these systems will be performed in collaboration with the New York City Police Department.



### Wearable Intelligent Nuclear Detection (WIND),

**FY14-present:** Explores using modular backpack-based detectors that will have the benefit of being the largest human-portable platform that can get close to a conveyance. The backpacks allow for hands-free operation which can support overlapping missions and offer a low profile in public settings compared to handhelds. Advanced algorithms will be developed to support mapping, detection, localization, tracking, and identification.



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April 2016

tomography imaging systems.

#### **Airborne Radiological Enhanced Sensor System (ARES), FY12-present:**

Explores uses of non-radiation detection signatures (e.g., video, target tracking, LIDAR, and topological and GPS data) fused with gamma detection to enhance the ability to detect radiological sources from an airborne platform.



#### **Long Range Radiation Detection (LRRD), FY12-FY15:**

LRRD is part of a spiral development of the previously demonstrated SORDS and Roadside Tracker System (RST). Both systems used coded aperture imaging to enhance detection of radiological sources. While the SORDS truck detects from a mobile platform, the RST can detect ~mCi source in a vehicle moving at up to 70mph across 5 lanes of traffic. The LRRD is enabling further algorithm development necessary to make these viable.



#### **Mobile Urban Radiation Search (MURS), FY15-present:**

Takes the knowledge and technology of previous stand-off detection projects to produce a production-ready, compact, and modular radiation sensing system for a van or SUV-based platform. The radiation detectors will be coupled to an advanced contextual sensor package, including LIDAR and video imaging. The project will emphasize the operational and suitability requirements rather than furthering detection capability.



#### **Advanced Radiation Monitoring Device (ARMD), FY10-FY15:**

Developed an advanced spectroscopic personal radiation detector for enhanced detection, identification, and localization of radiological sources. Devices were built using new, high energy resolution materials, CLYC(Ce) and SrI<sub>2</sub>(Eu) developed under DNDO's ER program. Additional performance enhancement comes from the ability to use pulse shape discrimination in the CLYC scintillation response to detect and differentiate between gamma and neutron events.



#### **Nuclear and Radiological Imaging Platform (NRIP), FY12-present:**

Determines the benefit of fusing active interrogation, imaging modalities, and passive signatures together to enhance detection of shielded nuclear material.

Technologies being investigated through this include enhanced SNAR-systems with fused passive detector data, commercial-off-the-shelf radiography integrated with radiation portal monitors, and a muon



Solicitation information is available at [www.fbo.gov](http://www.fbo.gov). For questions about the ATD program, please contact [dndoatd@hq.dhs.gov](mailto:dndoatd@hq.dhs.gov).



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