

Testing Underway Decision Sciences' Muon Tomography System

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Los Alamos National Laboratory (LANL) earlier this spring began testing a prototype of a new cargo screening system developed by Decision Sciences Corp. (DSC) that is based on Muon Tomography (MT) and is expected to have initial results read this summer showing whether the technology can detect special nuclear materials, company officials say.

DSC originally had hoped to have the testing underway last year (TR2, May 30, 2007). The testing, which is being paid for by DSC, will be ongoing and provide the company with continuous feedback about the performance of the Guardian MT system.

Last year DSC signed a cooperative research and development agreement with LANL for the development of the passive screening technology. As it stands now the technology is being developed to screen containers for special nuclear material that might be shielded. DSC is exploring the feasibility of the technology for explosives detection, company officials tell TR2 at the recent Department of Homeland Security's Science & Technology Stakeholders Conference sponsored by the National Defense Industrial Association.

The MT-based system takes images of decaying cosmic rays, or muons, which are constantly bombarding the earth. As the rays pass deflect through atoms, the Guardian MT's detectors measure the amount of deflection, which correlates with various elements on the periodic table. Those measurements, which are take using DSC software algorithms, allow for the creation of three-dimensional computer models of the materials that the muons pass through, thus permitting the detection of threat materials.

The MT technology won't identify materials but will allow users to know if the they are dealing with gamma radiation and mid-Z materials or high-Z and special nuclear materials, the officials say.

For the LANL tests DSC constructed a portal that is 12 feet by 16 feet by 16 feet. Because DSC is paying for the tests, it is hoping to get an award from the Domestic Nuclear Detection Office for additional development and testing, which the company believes would provide Guardian MT with more credibility as any test results would come from an independent entity.

DSC says that during a 30 second scan the Guardian MT gives operators a 95 percent probability of correctness as to the materials inside a container. The longer the scan time, the better the resolution, DSC officials say. They believe the system can meet typical DHS requirements of one minute or less to clear a container.

While DHS is moving forward on several fronts to develop, and produce, technologies for screening against radiological and nuclear threats, DSC believes if the Guardian MT testing proves successful, it will get its chance to compete for further development and production work. Moreover, company officials say that as the U.S. steps up its efforts to have more cargo screened overseas before heading here, foreign countries will begin demanding that U.S. exports be similarly screened for threats. That will open the market further, they say.