

This company's scanning technology is a smugglers' nightmare

May 10 2017, by Mike Freeman, The San Diego Union-Tribune

At Decision Sciences International Corp.'s headquarters, a 20-foot shipping container sits beneath a car-wash size scanner.

After about a minute, images of the container's contents pop up on a nearby TV screen, complete with a color-coded identification of the objects based on how they interact with naturally occurring subatomic particles.

It's not a pretty picture. There's ammunition, firearms, TNT, alcohol and currency inside. If shielded [nuclear material](#) were in the container, the company's technology would identify it, too, said [chief executive](#) Dwight Johnson.

"If you're (a customs) officer and you had a manifest that said it's all furniture, you'd stop right now," said Johnson. "It's not all furniture."

Last month, Decision Sciences, based outside San Diego, said it received a contract with the Singapore Ministry of Home Affairs to install one of its next-generation cargo scanning systems at its main port.

Though a pilot project, Decision Sciences is betting it will lead to further deployments of its technology, which is licensed from the Los Alamos National Laboratory and has been refined for more than a decade.

"In terms of total volume, Singapore is the second-largest port in the world," said Johnson. "So this is a very important event for Decision

Sciences."

The 70-employee company is one of a handful of firms working on new technology to better scan cargo containers, which became a priority after the Sept. 11, 2001 terrorist attacks.

These new systems aim to push beyond today's passive radiation detection and active high-energy X-ray based scanning - which do well uncovering smuggled nuclear material but aren't as good at finding narcotics, guns and other conventional contraband.

"The way to look at the next generation systems is going from human inspection of a projected image to materials identification," said Robert Ledoux, chief executive of Massachusetts-based Passport Systems, which recently deployed a next-generation scanning system in Boston.

"The real bottleneck in the existing systems is if you find an anomaly, your only option without materials identification is to de-van the cargo, and that can take tens of hours and cost a lot of money," he said.

Passport System identifies guns, drugs and other contraband based on their atomic number - a measure of their density. But it still uses high-energy X-rays in its scanning process.

Decision Sciences' scanning technique is passive. It doesn't use X-rays beams to create three-dimensional images or identify what's in a container.

Instead, it tracks naturally occurring subatomic particles called muons, as well as electrons, to call out a container's contents.

Muons are like electrons but heavier - with 200 times the mass. They're also very short lived. But when they hit something, they deflect at a

particular way, giving clues as to what the material is.

The company says its machine learning software uses this information - along with the behavior of nearby electrons - to uncover not only shielded nuclear material but also narcotics, firearms, cigarettes, smuggled people and other contraband.

Its scanner consists of thousands of vacuum-sealed aluminum tubes, each filled with an inert gas mixture and a proprietary electrode. The software creates an image of what's in the container and color codes it based on how these objects react to these naturally occurring [subatomic particles](#).

Each year, more than 11 million maritime containers arrive at U.S. ports. Another 13 million come in via by truck and rail, according to U.S. Customs and Border Protection.

Since 9/11, every [container](#) entering the U.S. by sea or land is scanned by radiation detectors over concerns that terrorists might try to smuggle nuclear weapons into the country.

In addition, Customs agents target about 5 percent of ocean-going containers as high risk. Those containers are subject to X-rays to get an image of what's inside. No nuclear materials have ever been found.

Decision Sciences thinks more containers can be scanned faster with its technology.

"What I think we have is a platform technology, let's call it charged particle tomography," said Stuart Rabin, head of New York-based Nine Thirty Capital and chairman of Decision Sciences' board of directors. "If you have a passive product that can be deployed in multiple locations and scan a large percentage of the volume, it opens up all sorts of applications."

It took years to get the technology right, said Johnson. "Some of the original patents go back 10 years, but I would say it has been in the last couple of years that the product fundamentally changed."

In 2012, Decision Sciences, at its own cost, installed an early version of the system at a port in the Bahamas to collect data.

Rabin declined to say how much the company's car-wash size scanning systems cost. He also wouldn't reveal how much money has been invested in the company, which Rabin said is mostly privately funded.

Last year, it did receive a contract from the Pentagon's Combating Terrorism Technical Support Office with a potential value of \$5.2 million.

While the company is focused on cargo containers at ports for now, it sees the potential to expand into other industries, such as sporting event security or protecting critical infrastructure.

Ledoux of Passport Systems called his company's technology more "imaged based" and "comprehensive" than Decision Sciences' system, but also likely more expensive because it generates an X-ray beam.

"It's apples and oranges, but I think the government wants to test both and that is a good thing," he said.

©2017 The San Diego Union-Tribune
Distributed by Tribune Content Agency, LLC.

Citation: This company's scanning technology is a smugglers' nightmare (2017, May 10) retrieved 23 April 2024 from

<https://phys.org/news/2017-05-company-scanning-technology-smugglers-nightmare.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.