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Excerpts from: Raising the bar of radiation scanning

The complete story is available in the November edition of World Cargo News.

Spreader-based radiation detection systems have now completed field tests at three locations in US ports

Work on spreader-mounted radiation detection has progressed strongly in the past year or so at Cargotec Port Security, LLC (CPS). As previously reported (*WorldCargo News, April 2008, p3*), CPS is wholly-owned by Cargotec Corporation in Finland and is taking forward the work that leading spreader maker Bromma, part of Cargotec through Kalmar Industries, had been doing in the USA. CPS is based in Durham, NC and is run by Troy Thompson, who was previously president of Bromma USA, Inc...

New partners

Within the ambit of CPS the technology licensing, continuing R&D and technical support is coming, as previously reported (*WorldCargo News, July 2007, p4 and September 2007, p52*) from **Innovative American Technology (IAT)**, based in Florida. Integration services are provided by SI International, the systems integrator for the US Department of Energy's (DoE) Megaport Program, and by Lockheed Martin, which is involved in the MIDAS project (maritime integrated domain awareness solution).

CPS's **spreader bar radiation verification system (SBRVS)** uses sensors supplied to **IAT** by Sanmina-SCI. These are configured with multiple and commercially available off-the shelf analog gamma radiation and neutron detectors. There are individual TCP/IP addresses for each sensor. The system provides isotope identification, measurements of isotope characteristics and proportional mix, spectral data acquisition and analysis. It eliminates false alarms caused by naturally occurring background radiation, or radiation from harmless sources (bananas, cat litter, etc).

Visually the spreader looks like a conventional Bromma spreader of the same specification, except that the drawbars are wider and taller to accommodate the distributed sensor arrays. There are also two square sensor boxes built into the underside of the main frame.

CPS uses the Monte Carlo N-Particle Transport Code software package, developed at Los Alamos National Laboratory. A post processor simulates the effect of the electronics in the sensors. Multiple count rates create a variety of spectra for a known isotope database...

100% scanning law

The core activity of radiation detection has been given added urgency by the US requirement that all containers inbound to the US be scanned for fissile material in the port of loading by July 2012.

The Bill signed into law by President Bush in August 2007 allows the Department of Homeland Security (DHS) to extend the deadline in 2-year increments, but the expectation is that the technology will be ready sooner rather than later.

As far as CPS is concerned, Thompson states that the SBRVS has been in US government testing for almost one year. This started with a working model test at the DoE's Oak Ridge National Laboratory (ORNL), together with audit and analysis of compliance with ANSI N42.43 and N42.38 conducted at ORNL under the supervision of Peter Chiaro, the chairman of the ANSI committee that produced those standards.

This included 300 consecutive tests using a variety of radiological materials. The isotope test results were 100% results and there were no false positives or false negatives. A second round of testing included vibration and shock analysis. The SBRVS was subjected to 2000 cycles of shock and vibration loads with forces between 180g and 250g.

The laboratory tests have been followed by two field evaluations, at Charleston and, more recently, at Tacoma, under the supervision of US Customs and Border Protection (CBP). In Charleston, says CPS, gamma and neutron sensitivity testing resulted in detection and identification at all points tested across the container. The system detected neutrons as it approached the container, prior to connecting, and even when the material was placed within seven layers of shielding.

The Tacoma tests were carried out in July and August...

QATT designation

CPS has received QATT (qualified antiterrorist technology) "Designation" status from the DHS under the terms of the US 2002 Safety Act. This is defined as "proven effectiveness, with confidence of repeatability." It is valid to the end of 2013...

"Designation" allow(s) the products to be supplied, but the supplier has to cover liability up to US\$1M from his own insurance (this is very expensive!) Above US\$1M indemnity, the US government accepts liability... under Designation it covers "all and any deployment..."